

*Archives of*  
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Cleveland

**ANNUAL SESSION NUMBER**

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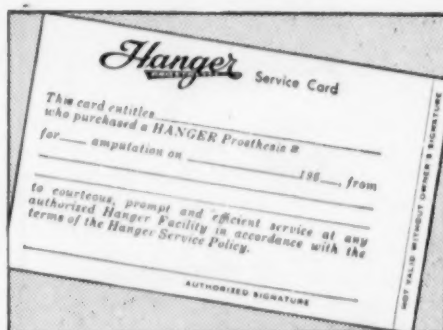
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# Rehabilitation of the Chronic Rheumatoid Arthritic: A Two-Year Progress Report

Edward W. Lowman, M.D.

New York City

## Introduction

Of every 100 patients developing rheumatoid arthritis, at least 10 to 15 of them will progress ultimately to serious disability with total or partial functional incapacity. In the past, rehabilitation for the severely disabled rheumatoid has by and large been reserved for the patient with a quiescent or burned-out disease process, for it is established that results with this group can be productive. On the other hand, the problem of the chronic rheumatoid with persisting activity of the disease has been more of a moot one. In some rheumatological quarters, the proposal that drug therapy might be combined with rehabilitation efforts for these cripples has elicited a firmly negative attitude. Admittedly, the chronic rheumatoid presents a problem unlike any other in rehabilitation; for not only is there mechanical disability, but also a painful progressing disease. We have felt, nonetheless, that a positive approach should be pursued to assay the feasibility of the proposal.

## Program Initiated

Three years ago a pilot group of chronic active rheumatoids was admitted to the rehabilitation wards at Bellevue Hospital and studied for a period of nine months. From this study, the present organized research program crystallized. In December, 1951, under the auspices of the Institute for Arthritis and Metabolic Diseases of the United States Public Health Service, a research unit was established at Goldwater Memorial Hospital consisting of 25 beds staffed with a rheumatologist, a psychia-

trist, a psychologist, a psychiatric social worker, a nurse, and physical therapy and occupational therapy personnel.

In the first year of the study, certain arbitrary criteria for admission of patients were rigidly adhered to. Patients had to be within the 21 to 55 year age group. The rheumatoid process had to be an active one. For purity of statistical analysis, patients obviously in need of corrective orthopedic procedures were excluded. There could be no medical contraindication for hormone therapy and the patient had to have severe functional impairment. In order to quantitate functional incapacity more precisely than the Class I through IV system of the American Rheumatism Association, a rating method similar to that used at the Institute of Physical Medicine and Rehabilitation was adopted. A list comprising over 100 activities (Activities of Daily Living) considered necessary to self-sufficient living was compiled. The activities were categorized into 10 major groups and to each group a score of 10 per cent was ascribed. It was decided arbitrarily that a patient must score at least a 40 per cent deficiency in these activities after establishment on cortisone or any other type of anti-rheumatic maintenance medication to qualify for the "severe disability" group. This group of the first year consisting of 24 patients is referred to as Group 1.

Read at the Thirty-second Annual Session of the American Congress of Physical Medicine and Rehabilitation, Washington, D.C., September 10, 1954.

From the Departments of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center and the Goldwater Memorial Hospital.

This study has been supported by a grant from the National Institute of Arthritis and Metabolic Diseases, U. S. Public Health Service.

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In the second year of the study, a more lenient set of criteria was adopted in order to obtain a comparison group. Patients still had to have an active disease process. Problems which were primarily of an orthopedic corrective nature were excluded. Functionally the patient had to be sufficiently disabled to be unable to carry on a gainful occupation, either a job in the case of the male or housework in the case of the female. The 26 patients meeting these revised criteria are referred to as Group 2.

On December 1, 1953, the two-year hospitalization portion of the study was terminated. The present year is the first of a three-year follow-up study of the total group of 50 patients who were accepted for hospitalization and treated with a combined medical and rehabilitation program.

### Results

In the course of the first two years of the study, a total of 285 patients was referred to the project as severely disabled rheumatoid arthritic cripples. Of this total, 235 referees were rejected as unsuitable candidates and the remaining 50 were accepted for study. In table 1 are listed the reasons for rejection of patients. It will be noted that a large number of patients in the first year were

Table 1: Breakdown of Reasons for Rejection

a. NOT RHEUMATOID ARTHRITIS	24
b. DISABILITY NOT DUE TO RHEUMATOID ARTHRITIS BUT HAS RHEUMATOID ARTHRITIS	14
c. DID NOT DESIRE THERAPY ON PROJECT	20
d. Problem primarily orthopedic	6
e. Receiving care at clinic or by doctor who felt patient would not benefit from Project	10
f. Needed only cortisone or other Arthritis Clinic care	6
g. OVER OR UNDER AGE	21
h. Cortisone contraindicated	13
i. No care indicated (and/or arthritis burned out)	17
j. Non-resident	
k. NOT SUFFICIENTLY DISABLED	49
l. Lack of motivation	7
m. Unable to evaluate	6
n. Needed care but not cortisone	6
o. POOR PSYCHOLOGICAL RISK (including low IQ)	12
p. Unknown (or miscellaneous)	19
q. Not financially eligible	1
	235

rejected because they did not meet disability requirements or because they did not fall within the stipulated age group. More significantly, it should be pointed out that 24 patients, or a total of 9 per

cent, referred as severely disabled rheumatoid arthritics, did not have rheumatoid arthritis. Further, an additional 14, or 5 per cent, though afflicted with rheumatoid arthritis, presented other major medical problems of considerably graver prognosis to them than their arthritis.

Of the 50 patients accepted for the combined medical and rehabilitation program, 24 met the criteria of Group 1, and 26 the criteria of Group 2. Following admission to the hospital, 6 patients of each group were separated from the study for the reasons listed in table 2. Three deaths occurred among patients in Group 1, none of which were related to medications or to participation in

Table 2: Arthritic Patients Accepted

	Group I (Severely Disabled)	Group II (Less Severely Disabled)
Total number:	24	26
Separated:		
Death	3	
Psychotic	1	2
Pre-psychotic	1	
Hysteria	1	
Senility		1
Voluntary		3
Sub-total:	13	20
Sex:		
Male	8	7
Female	10	13
Average age:	46.2 years	40.2 years
Average duration disease:	13.2 years	7.2 years

treatment programs, i.e., cardiac failure, septicemia, and renal failure from old vitamin D intoxication. Similarly, the psychiatric diagnoses listed were established after definitive workup in the hospital and prior to any treatment. A total of 18 patients remained in Group 1 and 20 remained in Group 2. The average age of the severely disabled patient was 46.2 years with a disease duration of 13.2 years; in the less severely disabled group, the average age was 40.2 years with a disease duration of 7.2 years. It is of interest to note that the difference in ages between the two groups represents approximately the difference in longevity of the disease process.

In the medical management of the rheumatoid arthritic process, only 5 of the 38 patients could be maintained on salicylates alone. In the great majority of cases (25), cortisone or oral hydro-



cortisone was necessary to control the activity of the rheumatoid process. Eight of the patients fared satisfactorily on phenylbutazone.

Classification of the 38 patients in the two groups according to the method of the American Rheumatism Association is tabulated in table 3. It will be noted that the majority of patients of both

Table 3: American Rheumatism Association Classification

	Initial		Discharge		Grade
	Stage	Class	Stage	Class	Improvement
GROUP I: (18 patients)	0=I	0=I	0=I	2=I	0=I
	1=II	0=II	1=II	10=II	10=II
	6=III	5=III	6=III	5=III	8=III
	11=IV	12=IV	11=IV	1=IV	0=IV
GROUP II: (20 patients)	3=I	0=I	4=I	9=I	3=I
	4=II	6=II	3=II	9=II	11=II
	12=III	10=III	12=III	2=III	5=III
	1=IV	4=IV	1=IV	0=IV	1=IV

groups was predominantly of stage 3 or 4 and of class 3 or 4. As might be expected, little change in stage classification occurred following treatment. On the other hand, there was a marked shift from functional classes 3 and 4 into classes 1 and 2. Of the severely disabled, for example, 12 of the 18 patients improved functionally in a manner sufficient to shift into classes 1 and 2. Similarly, of 14 less severely disabled initially in classes 3 or 4, only two remained in these classes following treatment. This improvement in function is more precisely shown in table 4 wherein functional deficiency has been rated in percentage using the direct functional testing method (ADL rating method). It

Table 4: Functional Deficiency\*

	Group 1	Group 2
Number of patients:	18	20
Before medication:	—60%	—30%
After medication:	—53% (15 patients)	—13% (18 patients)
After rehabilitation:	—29%	—4%
Duration of treatment:	339 Days	223 Days

\*Direct functional testing according to activities of daily living list.

will be noted that among the severely disabled group, the average functional deficiency before anti-rheumatic medica-

tion was 60 per cent and that following establishment on maintenance medication, this deficiency had decreased to 53 per cent. Following an average total treatment period of 339 days, there remained an average residual functional deficiency of 29 per cent. Among patients in Group 2, the average initial functional deficiency was 30 per cent. This deficiency improved to 13 per cent after establishment on maintenance medication. Following a total treatment period of 223 days, the average residual function deficiency was 4 per cent. It is significant to point out the relatively greater improvement in function following medication alone in patients of Group 2 as compared with patients of Group 1. This is interpreted as indicating greater mechanical disability among the severely disabled as a result of joint deformity and muscle weakness as opposed to disability resulting from the pain of an active disease process alone; the reverse applied to the less severely disabled.

The final disposition of the 38 patients is noted in table 5. Four patients of

Table 5: Final Disposition

	Total	% Improvement in Function
GROUP 1:	18	
Discharged totally self-sufficient:	7	+39%
Discharged partially self-sufficient:	7	+26%
Custodial hospital:	4	+20%
Jobs:	1	
GROUP 2	20	
Discharged totally self-sufficient:	15	+21%
Discharged partially self-sufficient:	5	+20%
Jobs:	7	

the severely disabled group remained as custodial hospital-care cases; fifteen patients initially had been hospitalized for a total of more than 200 days each. One patient of Group 1 and seven of Group 2 were placed in full time jobs. Only one patient of the total number had been partially employed prior to treatment. These eight patients were placed in jobs outside their homes and are exclusive of housewives discharged to their homes capable of partially or completely caring for their households.

### Conclusion

A total of 38 chronic rheumatoid patients have been hospitalized in the past two years and treated with a combination of medical and rehabilitation programs. Eighteen of these patients were severely disabled cripples, while 20 were less severely crippled. The average age of the derelict group was 46 years with a disease duration of 13 years. Of the less severely disabled group the average age was 40 years with a disease duration of 7 years.

Of the 18 severely disabled, 14 have been discharged from the hospital. Seven of these are totally self-sufficient and one has been job-placed. The other 7 have been discharged partially self-sufficient with an average increase of 26 per

cent in functional capacity. Four patients of the group remain custodial hospital cases; among these there has been a 20 per cent increase in function.

Of the 20 less severely disabled, all have been discharged from the hospital. Fifteen are totally self-sufficient while the remaining are partially so with an average increase of 29 per cent in function. Seven of these 20 patients have been placed in full-time jobs.

With the concerted teamwork attack such as used in this study, it would seem that the chronic rheumatoid is not an insoluble problem. Many could be salvaged from their invalidism and brought back to productive living.

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## Post-Operative Rehabilitation in Hip Arthroplasties

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Although rehabilitation has been developed in the treatment of the chronically disabled, little attention has been given to post-operative problems. Historically there has been progress in all surgical technics. Specifically in hip surgery, we have passed through the eras of Whitman's reconstruction, Smith-Peterson's vitallium cup, to present day acrylic and vitallium replacements. Even the latter are being improved to follow the normal lines of stress. When hip replacements were first introduced, the patient was placed in a long leg spica for more than three weeks and no early therapy was possible. It was only after we could allay the surgeon's fear of subluxation, that the traction technic was used. It is our responsibility to support the surgeon's work with an adequate rehabilitation program.

Hip arthroplasties are most frequently performed in advanced osteoarthritis, rheumatoid arthritis, old fractures with

non-union or avascular necrosis, and new fractures of the surgical neck of the femur.<sup>1</sup> Several approaches to this operation are now in use. These are by location, the anterior,<sup>2</sup> anterior lateral,<sup>3</sup> lateral,<sup>4</sup> posterior lateral,<sup>5</sup> and posterior.<sup>6</sup> The importance of approach is 1) how the hip is dislocated; 2) if any muscles were sectioned; 3) was the greater trochanter osteotomized,<sup>7</sup> and 4) degree of stability. After replacing the head, the surgeon tests the joint for stability in all motions. In anterior group of approaches, subluxation is more apt to occur in adduction and external rotation.<sup>8</sup> After surgery these patients are placed in abduction in a balanced suspension traction with Pearson attachment and in-

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ternal rotator straps on the thigh and calf. When patients cannot be maintained in this position, Wilke boots are applied which still allow early rehabilitation. In posterior types of approaches, subluxation occurs in internal rotation. These patients are easier to maintain. External rotation is a position from which subluxation is not apt to occur, so it is not detrimental if correct position is not steadily maintained. These patients are placed in abduction and neutral rotation. These are only generalities and since there are many different operations, each case must be considered individually.

The first duty of the physiatrist is to consult the surgeon. From this consultation is determined the probable stability of the hip which will govern the progress of rehabilitation. Next, the physiatrist should establish rapport. The patient should be given an overall picture of the extensive regime which is to follow; its aims, the importance of cooperation and active participation, and what results may be expected. The physiatrist should acquire an insight into the attitude of the patient and evaluate the amount of cooperation that may be expected. An attempt is made here to outline a rehabilitation program of six to eight weeks for the average in-patient after an arthroplasty. Variations should be made according to the needs and limitations of each patient. On the first or second post-operative day, the patient is instructed in abdominal, gluteal and quadriceps setting, and internal or external rotation exercises. Near the end of the first week, he is encouraged in limited flexion of the hip and flexion and extension of the knee with the aid of an overhead trapeze. By the twelfth day, the abdominal and thigh pressure binder and the sutures are removed. Thigh and calf slings manipulated by hand replace traction (fig. 1 and 2). The leg now rests on the bed and must be maintained in a position of stability by the patient. The nurse is instructed to check this position frequently. With the use of slings, active supported hip flexion and limited abduction is allowed.

In the beginning, fear of pain on



Fig. 1—Flexion of hip and knee in slings.



Fig. 2—Abduction of the hip in sling.

motion inhibits voluntary contraction of muscles. This can be overcome by continued practice. If proper treatment is planned and executed, function is restored gradually and the patient does not suffer unnecessarily. Violent and excessive exercise induces a severe reaction, which is actually injurious and incompatible with the purpose of treatment. Motion must not be cultivated too rapidly. Best results are obtained when passive and active motion are developed synchronously." In bed, roller-skating exercises to strengthen the abductors are begun. This is best accomplished while supine with the pelvis held in a level position and with equal range of motion of each leg. At first, the range of motion is from 30 degrees of abduction outward decreasing this angle until neutral starting position is reached without fear of subluxation. When full range of motion is easily accomplished, the skate may be attached to pulleys and resistance to abduction can be gradually increased (fig. 3 and 4). After a few days, if the incision is sufficiently healed, therapeutic pool treatments are begun. Within three and one-half weeks after surgery, the patient can walk the length of the pool from the deep to the shallow



Fig. 3 — Roller skates are used with resistance added to abduction. Single pulley system is used here for clarity but bilateral system is preferred.

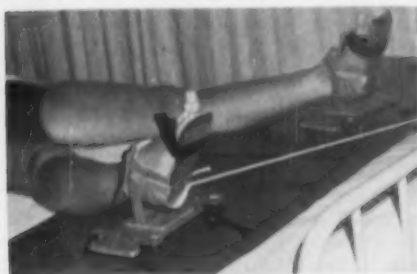


Fig. 4 — Close-up of skates and bed board.

end. When a therapeutic pool is not available some similar benefits may be derived from the Hubbard tank. If the latter is also unobtainable, the time required for complete ambulation is automatically increased because buoyancy of the water provides the patient with an opportunity to begin gait training with minimal weight bearing and without cumbersome crutches. The patient may now sit up in a chair twice daily. This position helps develop the shoulders and triceps by doing "chair push-ups." If sitting in the chair is well tolerated, the stationary bicycle may be used for two to three minutes twice daily increasing the time to fifteen to twenty minutes. The seat and handle bars may be raised if hip flexion is limited and gradually lowered as range increases. Progressive resistance may also be added in bicycle exercises.

The joints should be frequently ex-

amined for abnormalities of excessive pain, tenderness and swelling. If any abnormalities are present, rest is enforced until they subside. Activities are then cautiously resumed. Roentgenograms are taken frequently to check maintenance of position. If osteoporosis is present, active function should be developed as rapidly as possible. As soon as the bicycle is well tolerated, walking in the parallel bars with partial weight bearing two to three times daily then progressing to crutches should be started. Weight bearing can be checked and increased periodically by using an ordinary scale. The operated limb is placed on a scale while the other limb is on a platform at the same level. This method acquaints the patient with the amount of weight he is bearing and, at the same time, shows progress toward full weight bearing. When the patient handles his crutches well, elevation is started. After an elapse of six to eight weeks, sling exercises, roller skating, bicycle and crawling exercises should have increased strength and range of motion so that the patient is ready to be discharged. A home program of progressive resistive exercises should be initiated, with the patient returning for periodic examinations. Usually several months after discharge the crutches are replaced with a cane and soon after that no support is needed.

Unfortunately too many patients are satisfied with a moderate range of motion and fail to cooperate in complete restoration of muscle power. It is the duty of the physiatrist to make the patient realize that an incorrect walking pattern can damage not only the replacement but the other joints as well. In order to provide the patient with a well-rounded and complete program, the following should be emphasized:

1. Progress of activity with additional work is indicated as the patient regains strength.
2. The program must be so formulated to include intermittent periods of rest and activity.
3. The routine should be so well established by the time of discharge that

it becomes automatic at home.

4. The patient does most of the work by himself and progress depends upon the amount of effort expended. Muscle setting exercises, sling exercises, roller skating, chair push-ups, bicycle riding and crawling exercises can all be done with minimal assistance of a therapist. The fact that a therapist has but a limited amount of time to spend on each patient should not hinder progress to the desired result.

In general, the older age group makes up the greatest percentage of these patients. Complications are apt to occur which will require revision in the usual regime. Complications of interest to us fall into three groups namely, decubitus, senility, and incontinence. Those suffering from decubitus ulcers should be ambulated as quickly as possible. The Hubbard tank is used in place of the therapeutic pool since it can be easily sterilized. This treatment may be followed by ultra-violet irradiation applied locally. With senile patients nothing should be taken for granted. Few exercises but with constant repetition, should be given. Having the patient write the exercises in his own words on a card which is kept at the bedside is often helpful. The nursing staff will remind the patient to exercise at specific intervals. Incontinence is often relieved by ambulation. Daily SSE's early in the morning will often keep the bowels clear for the day. Diapering can be used if necessary. For treatment, the Hubbard tank may again replace the pool. In this age group, alternate work and rest periods should be carefully planned since overwork may be injurious. Good results cannot be expected here and the physician must be satisfied if ambulation and elevation without support are accomplished.

One of our patients, (L.S.) illustrated these problems. She was an 83 year old senile female. Within two weeks post-operatively, she developed incontinence and a sacral decubitus. The replacement was found to be stable on the operating table. Ambulation and tanking at two weeks post-operatively proved

to be the best solution to this problem. Incontinence was cleared up in a few days. Proteins and fluid balance remained stable and adequate. The incision and decubitus healed without infection. If activity had not been initiated early, this patient would probably succumb to the multiplicity of complications which would undoubtedly ensue.

In sixty case studies where the patients were placed post-operatively in a spica thereby limiting rehabilitation, poor musculature and an abductor limp was evident in all but one. This jeopardizes the function of the prosthesis and places undue stress on other parts. Frequently the patient voiced no complaint about the operated hip but often complained about other joints. Abductor lurch has proved to be an outstanding problem in the rehabilitation of these patients. It is not uncommon. Unless a long-term plan is devised for the conditioning of these muscles and is continued, an abductor lurch is almost inevitable. It must be realized that these patients are in the older age group having poor muscle tone. Many have had chronic hip disease for years. Best results can be expected in new fractures, and especially in the younger age group,<sup>10</sup> since function was normal prior to injury. In general, this must be considered a chronic disease. These muscles cannot be built up in six weeks. This is merely adequate time to educate the patient to carry on for himself with supervisory check-ups. One year to eighteen months is the time we can expect to see muscles become adequate for good function. Another consideration is the fine mechanism of balance the abductors maintain and how easily it can be disturbed. Obesity in the absence of other pathologic factors can give an abductor lurch. An example of what can be done with a patient having Marie-Strumpell arthritis with fusion of both hips for sixteen years pre-operatively is evidenced in the fact that in three post-operative weeks this patient was able to do active assistive abduction as the muscles could still function.

The following is a brief outline of one



report showing a better than average result. B.W., a 71 year old white male, in 1951, fractured the surgical neck of the femur and had a Smith-Peterson nailing. He was permitted gradual weight bearing after six months and walked without assistance after a period of one year. He did well until June, 1952, and since then had increasing pain and disability. He came to the clinic dependent on one cane and one crutch. Roentgenograms showed an avascular necrosis of the head of the femur. All motions except extension were markedly limited. In November, 1952, this patient had an acrylic replacement of the head of the femur followed by an extensive rehabilitation program. Although he was a cardiac, he was well-managed throughout. He was discharged thirty-five days after surgery. He had no pain and was able to walk without the aid of crutches. Six weeks after discharge he was able to climb stairs independently, hop on the operated leg and had a smooth, even gait. In "end result" clinic one year after operation, the patient could walk twenty-five blocks without pain. He had flexion to 70 degrees, extension to 180 degrees, abduction to 60 degrees, adduction to 45 degrees, external rotation to 45 degrees, and internal rotation to 25 degrees. He was given a 4-4 rating which means that surgery was satisfactory and the patient was satisfied.

### Summary

A program of rehabilitating patients with femoral head replacements is offered including the following points: Importance of knowing type of approach, mode of dislocation and result of surgeon's test of stability during surgery; motions and positions to be avoided early; necessity of explaining overall regime to the patient, general program for the average patient:

First-second day — gluteus maximus, gluteus medius, abdominal, quadriceps setting and rotation exercises;  
Fourth-fifth day — limited flexion of the hip as well as flexion and extension of the knee;  
Twelfth day — sling exercises, flexion

and limited abduction;

Two weeks — roller skating;

Two and one-half weeks — pool; walking in pool two to three days later;

Three weeks — up in wheelchair;

Third-fourth weeks — bicycle, and

Four weeks — parallel bars to crutches.

When crutch walking is stabilized, crawling exercises should be started. When crawling is tolerated, stair climbing should be begun. Discharge on partial weight bearing should be withheld until muscle power is adequate and gait pattern is as normal as can be expected, and complications and means of treating them is determined.

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# Rehabilitation of Cup Arthroplasty

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Although great impetus has been given recently to the reconstruction of joints, arthroplasty was performed as early as 1827.<sup>1</sup> Rhea Barton restored motion to an ankylosed hip by performing a juxta-articular osteotomy, and prevented reunion by repeated passive motion. Following this, many workers used this technic and reported cases in which a fair degree of motion could be maintained, particularly of the upper extremities, where weight bearing was no factor. Ollier<sup>2</sup> was one of the first to place a buffer between the recreated articular surfaces in an attempt to prevent cross osteogenesis or interosseous fibrosis. Adipose tissue, fibrous tissue and pedicled flaps of muscles were used as the buffers, but these substances soon disappeared allowing the joint to ankylose. Carnochan<sup>3</sup> inserted a piece of wood between the articular surfaces of a resected temperomandibular joint, but this operation was never repeated. Pean<sup>4</sup> placed a metal plate between the bone ends and instituted early passive motion. Chlumsky,<sup>5</sup> using laboratory animals, systematically experimented with various types of materials, such as magnesium, tin, zinc, silver, celluloid, rubber, collodion and decalcified bone. He discovered that some of these acted as foreign body irritants, while others were easily absorbed. Foederl<sup>6</sup> found that the membranes of pigs' bladders could be used, as they were tough, could withstand the stress of weight bearing and did not absorb. This material was used as a buffer in arthroplasties at many foreign clinics. In 1902, John B. Murphy<sup>7</sup> employed the pedicled flap first proposed by Helfrich in 1893, using para-articular fat and fascia. The same year Robert Jones<sup>8</sup> used gold foil in a hip arthroplasty and followed his patient for twenty-one years. This was and still is

the longest follow-up of any patient with a hip arthroplasty.

In 1923, a piece of glass which had been embedded in a patient's back, was removed and was found to be lying in a sac containing a small amount of clear yellow fluid. The sac was lined with synovial membrane and the fibrous tissue reaction about it was minimal. This observation led Smith-Peterson to conceive the idea of "mould" arthroplasty. He used glass as a mould but because the glass broke in several instances, its use was discarded. Later he experimented with Viscaloid, a form of celluloid, but this caused foreign body reaction and had to be discontinued.<sup>9</sup> In 1936, Venable and Stuck<sup>10</sup> reported on a new alloy Vitallium in the treatment of fractures, and its use as a mould for arthroplasty of the hip was suggested to Smith-Peterson by a dentist, John Cooke.<sup>11</sup> In June 1938, Smith-Peterson performed the first vitallium mould arthroplasty. This material has become quite popular and is being used widely now in the reconstruction of joints.

Previous to the use of a mould, arthroplasty consisted of shaping two joint surfaces mechanically suitable for function. The ends were covered with a lining that would prevent re-ankylosis and would allow the surfaces to glide against each other. Many reasons accounted for the previous failures, namely lack of proper instruments and inadequate surgical technics. One most important cause of failure was the lack of an inert barrier substance that would not absorb or cause a foreign body reaction, and yet be able to withstand the pressures within the joint. The introduction of an inert

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mould created two congruous surfaces, mechanically suitable for joint function, allowing the fibrous tissue to be confined to the periarticular region, thus forming a joint capsule. Since the mould was held in place only by its position, it could move over the femoral head as well as inside the acetabulum allowing repair of the surfaces of these structures to take place. During repair, fibrous tissue covers the raw end of the bones and gradually undergoes metaplasia into a hyaline type of fibro-cartilage. As vitalium is electrically inert, it is not necessary to remove the mould once repair of both the femoral head and acetabulum has been established.

The indications for cup arthroplasty are as yet ill-defined. Most workers feel that pain, not relieved by conservative measures, is the major indication. Other reasons for reconstruction of the hip are presence of a fixed deformity or a bilateral ankylosis. We feel that the indications should be more specific and will discuss this later. The preoperative care is no different from that of any other orthopedic patient except for more attention to weight reduction and possibly muscle setting exercises.

The post-operative treatment of these patients is most important. Rhea Barton recognized this as early as 1827, when he advised persistent passive motion to prevent ankylosis and maintain adequate mobilization. Smith-Peterson<sup>11</sup> placed his patients in a Hodgen splint with a Pearson attachment so that they could carry out active exercises of hip and knee joints with gravity removed. After fourteen days, roller skating exercises were started. At the end of four weeks the patient was allowed to sit in a chair, and to exercise on a stationary bicycle. Later a walker was used and crutch walking was started. Crutches were used for a minimum of six months, especially when walking outdoors. Flexion, extension, abduction and internal rotation exercises were continued indefinitely. Gibson,<sup>12</sup> on the other hand, kept the patient in bed for four weeks during which time assistive to resistive exercises were carried out. Others have kept the

patients in traction suspension for several weeks, then started active exercise in the Hubbard Tank.<sup>13</sup> It readily can be seen that there is no uniformity of opinion regarding adequate post-operative care.

One of us (C.B.L.) formerly an associate of Dr. Smith-Peterson has long been interested in the post-operative treatment of cup arthroplasty. He has evolved a scheme of exercises, which we are now using at the University Hospital. The post-operative care is divided into three phases, the first phase concerning itself mostly with the surgical aspects, the second phase with ambulation and the third phase with the convalescence or home care. Muscle setting of the quadriceps, internal rotators, abductors and gluteal muscles is started about the fourth day, as is dorsiflexion of the foot and extension and flexion of the toes. Roller skating exercise in bed is started at about the 26th day and at the 28th day, the patient is allowed to stand for 10 or 15 minutes, bearing only partial weight on the operated leg. For the next two weeks, the patient is taught to use a stationary bicycle, ambulate on crutches and exercise in a rocking chair. During the first phase it is important to maintain as much passive flexion and extension as can be tolerated. As soon as the patient is able to walk without evidence of excessive tiring, he is discharged to continue exercises at home. The individual is warned against external rotation and adduction.

During the past four years, 102 patients, ranging in age from 16 to 84 years, were operated upon for reconstruction of the hip. By mere coincidence, 51 were males and 51 were females. Of the males, 60 per cent had degenerative arthritis, while only 37 per cent of the females had this condition. More women were operated upon for traumatic lesions than men, 43.1 per cent against 33.3 per cent (table 1). The rest of the patients had either congenital defects or rheumatoid arthritis. The youngest patient in the series was 16 years of age. The greatest number

Table 1: The number and percentage of both male and female patients in each category.

Condition	DIAGNOSIS 102 Cases Cup Arthroplasty					
	Male		Female		Total	
	Number	%	Number	%	Number	%
Degenerative Arthritis	31	60.7	19	37.2	50	49.0
Traumatic	17	33.3	22	43.1	39	38.2
Congenital	2	4.0	5	9.8	7	6.9
Rheumatoid Arthritis	1	1.9	5	9.8	6	5.9

of male patients were between 50 and 60, while more women were between ages of 60 and 70 (table 2). The average hospital stay was 56.8 days. An average of 18 days was spent in the physical therapy department, from the beginning of ambulation to the time of

Table 2: The age distribution of both male and female patients showing number and percentage in each category.

AGE DISTRIBUTION 102 Cases Cup Arthroplasty Male										
Condition	Age									
	16-20	21-30	31-40	41-50	51-60	61-70	71-77	Num-ber	%	
Degenerative Arthritis	3	3	1	3	13	6	2	31	60.7	
Traumatic		2	4	3	3	3	2	17	33.3	
Congenital		1	1					2	4.0	
Rheumatoid Arthritis		1						1	1.9	
Female										
	16-20	21-30	31-40	41-50	51-60	61-70	71-84	Num-ber	%	
Degenerative Arthritis	2	5	1	1	3	7		19	37.2	
Traumatic		1	2	1	4	10	4	22	43.1	
Congenital			2	1	2			5	9.8	
Rheumatoid Arthritis				3	2			5	9.8	

discharge. Nine of the patients had to have a second operation and two were operated several times. Four individuals had an arthroplasty performed on the opposite hip. There were no post-operative deaths in this series. One woman, age 59, was returned to the hospital four

months after discharge, because of sudden onset of chills, fever and chest pain. A pneumonitis was found, but due to the fact that the causative organism was not sensitive to any of the antibiotics, her condition became worse and she died. Many of the patients, particularly the elderly group, were readmitted to the hospital on several occasions for more instruction in home care, or to stimulate them to further activity. The follow-up study ranged from six months to four years.

Bickel<sup>14</sup> and his associates set up certain criteria to evaluate the results of cup arthroplasty. They classified the end results as very good, good, fair and poor. There was little difference between very good and good, while the difference between fair and poor was dependent on whether or not the patient was satisfied. We were not interested in the operative technic, but rather in the overall result. It was decided to grade the end result as good, fair or poor. Those rated good had to have three or more of the following: (1) minimal or no pain; (2) ability to ambulate up and down stairs; (3) possibility of changing from crutches to cane within a year; (4) ability to tie shoes; (5) capability of returning to work, and (6) good control of the limb. Those classified as fair had two or more of the following: (1) moderate pain; (2) good range of motion but poor control of limb; (3) inability to ambulate on crutches for more than short periods of time; (4) necessity of returning to the hospital for further instruction or more work in the physical therapy department, and (5) need for cup revisions because of bony deposits about the cup or aseptic necrosis of bone underlying the cup. Those marked poor either still had pain, were unable to ambulate, or had poor control of limb and poor range of motion.

In the entire series, about three-fourths of the patients were rated as good, about one-fourth was rated as fair and only two patients were classified as poor (table 3). One of the patients classified as poor was a woman 75 years of age, who had had a traumatic injury

Table 3: The number and percentage of all patients classified either good, fair or poor.

RESULTS 102 Cases Cup Arthroplasty						
Condition	Good		Fair		Poor	
	Number	%	Number	%	Number	%
Degenerative Arthritis	40	39.2	9	8.8	1	0.98
Traumatic	26	27.4	10	9.8	1	0.98
Congenital	5	4.9	2	1.9		
Rheumatoid Arthritis	2	1.9	4	3.9		
Total	75	73.4	25	24.4	2	1.90

to the hip. She was very apprehensive, uncooperative and very slow in learning new exercises. The other patient, a male of 59 years of age, had degenerative arthritis of the hip. Shortly after the surgical procedure, he developed thrombosis of the deep veins of the left leg, necessitating ligation of the superior femoral vein. Despite this complication, he continued to improve but would either stop exercising or perform the wrong type of exercise, such as externally rotating instead of internally rotating the leg. It can be expected that we would obtain the best results among the private patients and the poorest results with the indigent patients. It appears that the male private patients had the best results as 93 per cent were rated good, while only 63 per cent of the male indigent patients could be classed as having obtained good results (table 4).

Table 4: Comparisons of results obtained in indigent, pay or private patients.

RESULTS 102 Cases Cup Arthroplasty						
	Good		Fair		Poor	
	Male	Female	Male	Female	Male	Female
Indigent	63.0%	70.0%	34.0%	26.0%	3.0%	4.0%
Pay	100.0%	100.0%	—	—	—	—
Private	93.0%	70.0%	7.0%	30.0%	—	—

However, there were only 14 private patients as against 32 in the indigent group, and therefore the percentage difference was not significant. There was no difference between the two groups of

women, as 70 per cent of both the private and indigent patients were rated as good. This can be accounted for partly by the fact that there were 26 indigent and 20 private cases among the women. Another factor which might influence the overall result is the type of disease present in the hip. Of the two groups having the largest number of cases, namely degenerative arthritis and traumatic lesions, the percentage having a good or fair result was nearly the same in both instances (table 5). There were

Table 5: Results obtained in the different conditions.

RESULTS 102 Cases Cup Arthroplasty			
	Good	Fair	Poor
Degenerative Arthritis	80.0%	18.0%	2.0%
Traumatic	71.7%	25.6%	2.5%
Congenital	71.4%	28.5%	—
Rheumatoid Arthritis	33.3%	66.6%	—

three types of surgical procedures performed in this series. The majority of patients had the standard type of arthroplasty in that the length of the surgical neck was maintained. Another group had some of the surgical neck sacrificed and the trochanter transplanted. In a smaller number, a shaft arthroplasty was carried out; the so-called Colonna type operation. The end result in the three types of operation was the same, and the age of the patient had no influence on this. The individuals that needed revisions of the cup did poorly, but after the second operation improved to the extent that their end result was rated either fair or good.

The results obtained in this series of patients would appear to be better than those reported by others. We believe that these findings are not different from those obtained by other authors as the results do not give the total picture in any given case. An individual could have very good motion, adequate length of the surgical neck for mechanical fulcrum, little or no pain, but suffer a severe limp due to muscle weakness.

Such a patient would be rated as good, even though the arthroplasty was not totally satisfactory. Another patient may have little pain, be able to walk moderate to long distances, but have restriction of motion due to scarring. Stability is gained by relying on the scar rather than the muscles of the hip. Such a case would be rated good but because of inability to return to his previous occupation, the prognosis is not entirely satisfactory.

In order to evaluate the multiplicity of factors which enter into the successful result from surgery, and the pre- and post-operative rehabilitation program, a new set of criteria must be established. It is further necessary to have such new criteria form the basis of a so-called "standard," not only to judge the adequacy of a given arthroplasty, but to compare the results with other types of hip operations being done for the same condition. These new criteria must take into consideration the psychologic make up of an individual as well as age and weight. The type and duration of the disease or lesion must also be considered. Other factors are the amount of fixed deformity; habit patterns which existed pre-operatively; muscle strength measured objectively, particularly the abductor mechanism; range of hip motion; length of lever arm or type of arthroplasty based on working stock; and most important, the amount of pain. The functional capacity of the subject may be obtained by measuring the ability to perform certain activities such as climbing stairs unaided; tying shoes; sitting at a table comfortably; driving a car; picking objects off the floor; carrying objects, such as a shopping bag; working; dressing, and finally, endurance.

If the criteria listed above can be applied pre-operatively, it may afford both the surgeon and physiatrist a more precise basis for predicting the end result. In addition, the same criteria used post-operatively may afford a more complete picture of the amount of total improvement. It is hoped that such a standard may be used to rate the results on a percentage basis. At present we are at-

tempting to set up such a "standard," in order to re-evaluate the present series of cup arthroplasties and compare them with patients who will be operated upon in the future.

### Conclusions

One hundred and two cup arthroplasties have been followed from six months to four years.

Nine cases needed revision of the arthroplasty. Bilateral arthroplasties were performed in four patients. One patient died of a pneumonitis four months after discharge.

Three-fourths, or 73.5 per cent were rated good; one-fourth, or 24.5 per cent fair, and only two or 1.9 per cent were rated poor.

The criteria used at present to judge the end result are inadequate and probably accounts for our good results.

A new set of standards based on psychologic make up, the physical and functional capacity of the individual, may afford a better evaluation of the total benefit derived from surgery and post-operative rehabilitation. Such standards might also be used as a more definitive indication for surgery.

The best results in cup arthroplasties can be obtained only by close co-operation of the orthopedic surgeon, the physiatrist and physical therapist.

### Appendix

#### Postoperative Routine Cup Arthroplasty

##### A. FIRST FOUR WEEKS

1. Immediately after operation, the operated leg is placed in balance suspension traction with 5 pounds of weight. The leg should also be in maximum abduction and internal rotation. Penicillin is given routinely, 100,000 units every 8 hours for 5 days. External rotation and adduction is to be avoided at all times.

2. *Third day:* The blood count is checked and portable x-rays are taken to determine position of the cup. Antero-posterior x-rays only are necessary.

3. *Fourth day:* Exercises are started



in the form of muscle-setting. This includes quadriceps, internal rotators, abductors and gluteal muscles. The patient is taught to dorsiflex the foot and at the same time, curl the toes. These exercises are done once or twice each waking hour.

4. *Tenth day:* The sutures are removed.

5. *Fourteenth day:* For a period of 15 minutes, morning and afternoon, the head of the bed is cranked up, to obtain as much hip flexion as the individual can tolerate. At night the patient is encouraged to be as flat as possible with the splint resting on the bed, to maintain hip extension.

6. *Twenty-fourth day* (or thereabouts depending upon type of reconstruction): The splint is removed and reapplied at night only.

7. *Twenty-sixth day:* Roller-skating exercises in bed are begun, providing the leg is comfortable when it is out of the splint.

8. *Twenty-eighth day:* Standing is permitted, placing both feet on floor, care being taken to bear little or no weight on operated leg. The patient can sit in a chair for 10 to 15 minutes.

#### B. AMBULATORY ROUTINE DURING REMAINDER OF HOSPITAL STAY

1. Patient is taught use of stationary bicycle which he rides 10 minutes twice daily.

2. Crutch-walking is started, bearing little or no weight on operated leg at first. In unilateral cases, three point gait is used; in bilateral arthroplasties, four point gait is employed.

3. A rocking chair is used in such manner as to obtain further flexion of hip.

4. Using a reciprocal pattern, patient is taught stair-walking.

5. The average case will be dismissed from the hospital 8 weeks post-operatively and is instructed to carry on the same ambulatory routine at home.

#### C. CONVALESCENT CARE

Patients will usually be seen for check-

ups about once monthly or until examiner is satisfied that good habits are being formed and progress is satisfactory. During these visits, it is necessary to check the gait in order to keep it symmetrical. Check permanent flexion to keep it stretched.

At the end of the third month or when deemed necessary, resistive exercises can be added in order to gain strength in hip flexion and abduction. At this time, patients may also be taught side jumping and front-to-back jumping, starting and ending in same place.

Somewhere between the sixth to the ninth month, unilateral arthroplasties may be ready to walk with a cane. The cane is held in hand opposite the operated hip. Bicycle and jumping exercises are continued. Special exercises for quadriceps and gluteus medius can be added. Post-operative x-rays are taken every 3 or 4 months during the first year.

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## Use of Ultrasonic Vibration in the Treatment of Pain Arising from Phantom Limbs, Scars and Neuromas: A Preliminary Report

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Utilization of ultrasonic waves in the treatment of phantom pain and painful neuromas has been described by a number of investigators.<sup>1-4</sup> In some instances, the amputation stump was treated locally and in others, in combination with either the stellate ganglion in upper extremity amputees or the segmental nerve roots in lower extremity amputees. Under the heading "Phantom Pain," Behrend<sup>5</sup> reported that ultrasound therapy applied over the corresponding segmental roots resulted in complete relief of pain in a double arm amputee. Kobak<sup>6</sup> indicates that the pain-relieving effects of ultrasound in phantom pain have been demonstrated to him "in a small series of amputees by local treatment of the stump and also the appropriate spinal roots." Schwartz<sup>7</sup> lists two cases of amputation stump pain treated successfully with  $\frac{1}{2}$  w/cm<sup>2</sup> for five minutes. The exact number of treatments given is not stated. Jones<sup>8</sup> has also reported the successful treatment of neuroma pain in two cases, and the lack of relief in one case of phantom limb pain.

In a study of 101,629 case reports collected by means of a questionnaire, Stuhlfauth and Woeber<sup>9</sup> report that of the amputation neuromas (number not stated) treated with ultrasound, 21

per cent had very good results; 53.5 per cent had good results, and 25.5 per cent remained unchanged. None were reported as having become worse as a result of treatment.

A recent article by Bierman<sup>10</sup> outlines the use of this modality in softening scars and releasing contractures of the hand. In the same article, the author describes the complete relief of pain in a hand burned by overexposure to x-rays, following the application of twelve ultrasound treatments.

This study was undertaken in an effort to evaluate the effect of ultrasonic waves upon the pain originating from amputation stumps, peripheral nerve injuries with neuroma formation, and healed scars. The presence of scattered and incomplete accounts in the literature, and the availability of such cases at our cen-

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ter gave the study further impetus.

### Method

The ultrasound generator (Birtcher Ultrasonic Therapy Unit U-101) used in this study had a frequency of 1 MC/Sec and an applicator surface of 5 sq. cm. Continuous ultrasonic energy at an intensity of 1 w/cm<sup>2</sup> was employed in all cases, except as otherwise noted. The majority of treatments was given for a duration of 5 minutes daily, 5 or 6 times weekly. Even-surfaced, fairly large areas were treated directly. Heavy mineral oil was used as the coupling agent between the sound head and the skin. Uneven areas were treated under water at a temperature of 101 F. with the transducer surface at one-half to three-fourths inch removed from the part being treated. A slow stroking movement controlled at a rate just above the patient's subjective sensation of tingling was employed. Momentary periods of stationary application were used over peripheral nerve neuromas; however, the patient was never permitted to experience undue painful or burning sensations. In no instance were skin changes or other deleterious effects observed as a result of a single or of a series of ultrasonic applications. The minimum number of treatments given in a series was three, the maximum number given was twelve. A second series of treatments was required in five patients because of the recurrence of the pain.

### Results

A total of 35 patients presenting 37 painful areas (2 patients had more than one area requiring treatment) received ultrasound therapy for varying periods of time determined by the response or by the lack of response to treatment. These patients were divided into the following pain symptom categories:

Combined phantom pain and stump pain .....	6
Combined phantom pain and scar pain .....	2
Combined neuroma pain and scar pain .....	3

Combined stump pain and scar pain .....	3
Stump pain .....	7
One patient was a bilateral amputee with bilateral stump pain.	
Scar pain .....	8
One patient had multiple painful scars and received a series to one area, and a second series to another area at a later date.	
Phantom pain .....	1
Neuroma pain .....	7
Total	37

### Criteria for Categories

The phantom pain categories deserve a brief clarifying statement. Nine cases of phantom pain were encountered in our study. In eight cases the phantom pain was coexistent with either stump or scar pain. Pressure applied over a specific portion of either the stump or scar usually intensified the phantom pain. For this reason it was considered desirable to list the two types of pain occurring in the same stump as a combined category. In the single case of isolated pain the patient complained of phantom pain only and it was therefore listed as a single pain entity.

Evaluation of the initial degree of pain and tenderness was based on a scale of 1+ to 4+, as follows: 1+ represents moderate pain and/or tenderness not requiring medication; 2+ represents moderately severe pain and/or tenderness requiring occasional medication but not interfering with sleep; 3+ represents moderately severe pain and/or tenderness requiring more frequent medication and disturbing the patient's sleep; 4+ represents severe pain and/or tenderness requiring fairly frequent or continuous medication and frequently disturbing the patient's sleep.

### Combined Pain Complaint Series

*Combined Phantom Pain and Stump Pain:* Of the six amputee patients in this group (table 1), two reported complete relief of both the phantom pain and the stump pain following six and five treatments, respectively. These were cases in which the pain was of comparatively recent origin.

Table 1: Combined Pain Syndromes

Type and No. of Cases	Duration Range In Months	Severity	Treatment Time In Minutes	Number of Treatments—Range	Method	Results
<b>Phantom and Stump</b>						
Lower Extremity - 5	1 - 10	2+ to 3+	5	5 - 17	D	Minimal phantom pain - 2 Complete phantom relief - 3
Upper Extremity - 1*	120	3+ to 4+	6	12	I	Minimal stump pain - 3 Complete relief phantom, minimal pain in stump.
<b>Phantom and Scar</b>						
Upper Extremity - 2	2½ - 3	3+ to 4+	5 - 8	7 - 12	D	Complete relief - 1 Minimal pain - 1
<b>Neuroma and Scar</b>						
Lower Extremity - 2**	72	3+	5	8	I-I D-I	Complete relief - 2
Upper Extremity - 2	6 - 24	3+ to 4+	5	10 - 12	D	No relief - 2
<b>Stump and Scar</b>						
Lower Extremity - 3	10 da - 1 mo	2+	5 - 8	5 - 17	D	Complete relief - 2 Minimal pain - 1

\* Received: 1.5 w/cm<sup>2</sup>, all other cases received 1 w/cm<sup>2</sup>.

\*\* Two sites in same patient

D — Direct

I — Indirect

In the four remaining cases, two reported complete relief of phantom pain but had residual stump pain. Two reported slight residual phantom and stump pain. One of the patients in this series reported total relief from the phantom pain although he retained the phantom sensation. This same patient had been unable to wear his below-knee prosthesis prior to treatment. He had sufficient relief after four treatments to resume his functional prosthetic training and subsequently enjoyed full time use of the limb.

**Combined Phantom Pain and Scar Pain:** Two amputee patients in this category received seven and twelve ultrasound treatments, respectively applied to the stump with complete relief in one patient and almost complete relief in the other patient (table 1). Figure 1 shows the application of ultrasound to the scar in one of these patients.

**Combined Neuroma Pain and Scar Pain:** The three patients in this group were of interest because of the lack of response to ultrasound treatment in two instances (table 1). One patient sustained shell fragment injuries to the left leg when wounded in action in 1944.

There was extensive soft tissue loss of the muscles of the lateral compartment, multiple scars, and a left foot drop. An arthrodesis of the left ankle was performed in 1945 with subsequent development of pain in the operative scar and paresthesias radiating from the region of the fibular head into the foot.



Fig. 1 — Phantom pain and scar pain in short A/E stump. Ultrasound is applied directly to the scar and over stump end.

There was 3+ tenderness over the ankle scar and 3+ tenderness with radiation into the foot on palpation of the superficial peroneal nerve below the fibular head. Following eight treatments to each area the patient reported complete relief of the peroneal nerve neuroma pain and ankle scar pain. Slight tenderness persisted over the ankle scar. Evaluation two months later showed his condition to be unchanged, i.e., he was still pain-free.

The two remaining patients had fairly long-standing causalgia-like pain several months after neurotomy of the ulnar and median nerves, respectively. One of these patients had a second surgical intervention for the removal of a painful neuroma in 1952 with recurrent pain shortly thereafter. Both had extensive scarring at the site of injury in the upper arm, complained of severe pain, and exhibited extreme tenderness. No change in the symptoms or findings was reported or observed as a result of ultrasound treatment.

#### *Combined Stump Pain and Scar Pain:*

This group was comprised of three amputee patients (table 1). The pain was of fairly recent origin in all instances and interfered with the patient's wearing a prosthesis. In two instances, total relief was obtained. In the remaining patient, sufficient relief was obtained to enable him to use the prosthesis full time. However, it should be added that short stationary applications of 3-6 seconds were required in this case to achieve the desired effect.

#### **Single Pain Complaint Series**

*Stump Pain:* A total of six patients and seven stumps were treated in this group (table 2). Five patients complained of pain of such intensity as to interfere with the wearing of a prosthesis, and the sixth patient was unable to use his hand effectively as a result of pain in an amputated finger stump. Of the five patients mentioned, one was a bilateral amputee requiring ultrasound treatment to both lower extremity stumps. In this group, four of the five patients reported complete relief and

one reported the presence of slight residual pain. All were able to complete the prosthetic training program. One patient with a tender and painful middle finger stump reported complete relief and regained the full use of his hand. No recurrence of pain was reported when he was re-evaluated two months later. One patient failed to respond after eleven treatments.

*Scar Pain:* Seven patients having painful and tender scars involving either intact extremities or amputated digits were treated with ultrasound vibrations. The duration of pain varied from two to eight months (table 2), and was sufficiently severe to interfere with function in all cases. Four patients in this group had sustained traumatic amputations of one or more digits, three involving the hand and one the foot (fig. 2). In all four patients complete relief of pain was reported, and in two of the patients complete relief of tenderness was observed. Two patients had slight residual tenderness which was insufficient to interfere with function. A three-month

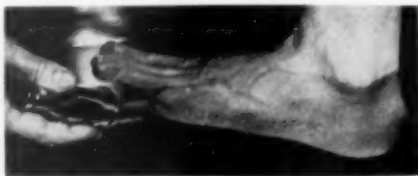


Fig. 2 — Severe scar pain at site of amputated fourth and fifth toes. Ultrasound is applied by immersion method.

follow-up in two cases revealed continued relief of pain. The other three patients in this group reported an excellent response to treatment and were returned to duty. One patient returned five months later for further treatment to a painful scar in another area of the same leg. This was also treated successfully.

*Phantom Pain:* A single case (table 2) of isolated intractable phantom limb pain of ten years duration was treated with ultrasound. Nine treatments were given, each eight minutes in duration. The response was extremely gratifying to the patient, who after five treatments stated, "This is the first time in ten years

Table 2: Single Pain Syndromes

Pain Type and No. of Cases	Duration Range in Months	Severity	Treatment Time In Minutes	No. of Treatments Range	Method	Results
<b>Stump Pain</b>						
Lower Extremity - 5	1½ - 6	2+ to 4+	5	4 - 13	D	Complete relief - 3 Minimal pain - 1 No relief - 1
Upper Extremity - 2	4 - 36	3+	5	4 - 6	D-1 I-1	Complete relief - 2
<b>Scar Pain</b>						
Lower Extremity - 4	3 - 5	3+ to 4+	5 - 10	6 - 14	D-2 I-2	Complete relief - 3 Slight residual - 1
Upper Extremity - 3	2 - 8	3+ to 4+	4 - 5	4 - 5	I-3	Complete relief - 3
<b>Phantom Pain</b>						
Lower Extremity - 1	120	3+ to 4+	8	9	D	Slight residual pain
<b>Neuroma Pain</b>						
Median nerve - 4	2 - 18	3+ to 4+	5	5 - 12	I	Complete relief - 4
Ulnar nerve - 3	2½ - 6	3+ to 4+	4 - 5	3 - 10	D-2 I-1	Complete relief - 3

Treatment Intensity: 1 w/cm<sup>2</sup> in all cases.

that I've been without pain for a period of several hours." He had previously been subjected to three revisions of his stump, psychotherapy and eventually, psychoanalysis. He had also received vitamin therapy and treatment with various physical agents without relief.

**Neuroma Pain:** Seven patients with neuroma pain (median nerve origin in four and ulnar nerve origin in three) received from three to twelve treatments. In all cases there was 3+ to 4+ pain and tenderness. Five patients in this group obtained complete relief of pain and tenderness. In two cases, follow-up evaluation six weeks and three and one-half months later revealed continued complete relief from pain and lack of tenderness. One patient had a recurrence of less severe pain one month later and was relieved with two additional treatments. The remaining patient, a civilian dependent, had essentially complete relief but retained mild paresthesias along the ulnar distribution in the hand. Treatment in this instance was not completed because the patient requested discharge to attend to family problems.

#### Pathological Tissue Study

Of the thirty-five patients treated with ultrasound, five subsequently had surgical procedures for stump revisions or

plastic procedures. Tissues removed from the treated areas were fixed immediately in Bouin's fixative and sent to the pathology laboratory. Careful study was then made of the microscopic sections and comparison with untreated neuroma tissue was attempted. Skin, connective tissue and nervous tissue were carefully examined for evidence of inflammation, coagulation necrosis, and other changes.

There was no evidence of destructive changes in the skin, connective tissue or nervous tissue of the treated specimens. Coagulation necrosis did not occur in any of the surgical specimens. Cellular infiltrates such as occur in burns were absent. Specimens taken from patients who received as many as twelve treatments failed to reveal any significant changes.

#### Discussion

Attempts to alleviate the pain arising from phantom limbs, neuromas, and scars by a multiplicity of conservative measures have not been too successful. Surgical intervention is, therefore, frequently required to achieve some degree of pain relief. Stump pain ascribed to neuroma formation tends to recur, even though temporarily relieved in some instances by surgery. Thus Kessler<sup>11</sup> has indicated that in painful stumps, local excision of the neuroma is not always



attended by relief and that excessive surgery, including re-amputation, is frequently of no avail.

Numerous treatments have been utilized for the pain of phantom limbs. Excision of local neuromas, rhizotomy, chordotomy, lumbar sympathectomy, ganglionectomy, and lobotomy have all been tried, yet none of these procedures is entirely successful in relieving this type of pain. Although there has been considerable speculation and study<sup>16-18</sup> on the subject of phantom pain, the cause of this condition is not completely understood. However, recent studies<sup>16,17</sup> by the University of California Prosthetic Research Team shed some light on the physiological mechanism involved.

In attempting to evaluate and test phantom limb pain the California group of investigators used a variety of methods including sympathetic blocking agents, local anesthetic agents, vasodilator drugs, and six per cent saline injected locally and at segmental levels along the interspinous tissues. From the results of their studies with hypertonic saline injections, certain clues were obtained which led to the following inferences with respect to deep pain and more pertinently to phantom pain:

(1) "That peripheral abnormalities, discretely located in the tissues affected, play a part in the production of the phantom image and phantom pain."

(2) "That peripheral sensory pathways, which prior to stimulation have been carrying abnormal impulses of excitation, have their function usurped by the impulse inflow engendered by the experimental stimulus," (hypertonic saline injected into the interspinous ligament of the segment involved).

(3) "This induced inflow replaces the abnormal patterns and blocks their transmission."

The investigators then proceed to point out that similar phenomena have often been noted in the case of spontaneous paresthesia and pain, and that the pins and needles sensation arising from ischemia is blocked by the application of pressure to the affected part. In conclusion they state that, "All such ob-

servations suggest that stimulation of deep tissue sensibility will displace abnormal sensations arising from peripheral foci of noxious excitation, if both stimulation and discomfort take place within the same sarcotome."<sup>18</sup>

In our own study we have attempted to determine the effect of locally applied ultrasound vibrations on pain syndromes having peripheral reference: namely, phantom pain, neuroma pain, and scar pain. In a group of thirty-five patients it was found that only three failed to respond favorably to this form of treatment. While adequate follow-up studies have not been possible, the consistently good response reported by the patient and evidenced in all instances by a corresponding decrease or disappearance of objective tenderness at the painful site in the cases of neuroma and scar pain, and of phantom pain previously intensified by local pressure of the stump or scar, support the contention that this modality has pain relieving qualities in such conditions.

The mode of action is subject to speculation. However, in the absence of histopathological findings such as necrosis, cellular infiltration, and other specific pathological change, it would suggest that a mechanical alteration occurs in the peripheral tissues. This may perhaps be induced by vigorous micro-massage (the stirring effect described by Lehmann and Biegler<sup>18</sup>) of the peripheral receptors, thus reducing or eliminating the abnormal sensations which are perceived as pain. Further support is given to the theory that the basis of phantom pain resides in abnormal peripheral stimuli rather than in purely psychological phenomena by the observation that there is progressive loss of phantom pain as a result of ultrasound application to the painful peripheral part in cases where phantom pain is combined with stump or scar pain. In such cases, pressure over some portion of the distal stump or scar prior to treatment was reported by the patient to aggravate the

<sup>18</sup>Sarcotome is defined as the peripheral unit of deep pain sensibility.



phantom pain and was referred to a portion of the missing part.

As with all therapeutic efforts directed toward the alleviation of pain, objective evaluation is extremely difficult. One must at all times be cognizant of the suggestive aspects of a treatment modality having the patient appeal of an ultrasound generator. To deny this as a factor in treatment effectiveness is not possible. However, it should be noted that almost the entire group of patients presented in this series were young males having relatively stable personalities as judged by their combat and personnel records. Each one appeared anxious to complete his rehabilitation and return either to duty or to civilian life. Each patient was aware of the fact that relief of pain was synonymous with early discharge from the hospital, and, in most instances, early return to duty status. It is also significant that of the thirty-five patients, seven follow-up evaluations obtained over periods ranging from one to five months revealed continued relief from the original pain.

On the basis of our studies it may be stated that ultrasound is a useful addition to the small number of effective or limitedly effective agents utilized in the treatment of phantom, neuroma and scar pain. Additional studies will be required to elucidate the exact nature of the mode of action, although it is our premise that the effects are due in large measure to mechanical changes. This is based on the lack of specific histopathological change, the small intensities employed in treatment, and the ineffectiveness of other forms of heat in alleviating the type of pain discussed.

It is our hope that the encouraging results obtained in the present study will serve to stimulate other investigators to utilize this modality in treating similar cases. Only in this way will it be possible to arrive at a more complete evaluation of its effectiveness.

### Summary

Ultrasound vibrations used in intensities of 1 w/cm<sup>2</sup>, with few exceptions, for short periods of time on a daily

treatment basis have effectively relieved the pain and tenderness of phantom limb, neuroma, and scar origin. In a series of thirty-five patients complaining of pain arising from one or a combination of the foregoing causes in 37 areas, 23 reported complete relief, 9 reported the persistence of only slight residual pain, and 3 reported no relief.

The reasons for considering the pain relieving effects of ultrasound as mechanical rather than thermal have been advanced.

**Acknowledgment** — The authors are grateful to the Laboratory Service in making available facilities for tissue study and in particular to Captain Kellenberger, Pathology Section, Brooke Army Hospital, for his help and interest in comparing, describing, and evaluating the treated and untreated tissues. The untreated tissues were obtained from the surgical files of the Pathology Section.

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## Biophysical Effects of Ultrasonic Energy on Carcinoma and Their Possible Significance

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### Introduction

In 1944 and subsequently, when Horvath<sup>1,2</sup> claimed that human cancer could be cured by ultrasonic treatment, the investigations of the effects of ultrasound on tumor tissue were considerably stimulated. During the International Congress in Erlangen in 1949<sup>3,7</sup> it was agreed, however, that ultrasonic energy could not be used for treatment of tumors, since a regression of growth could be obtained in a few cases only and the well-established x-ray therapy produced results far superior to those obtained with ultrasonic energy. In some cases exposure to ultrasonic energy caused even a more rapid growth and such exposure was, therefore, considered to be potentially dangerous.<sup>7,8</sup> Finally, it was concluded that the use of ultrasonic energy for treatment of tumors should not be recommended because the mode of action of such energy on tumor cells was not properly understood.<sup>9</sup>

A considerable amount of experimental work over a period of many years showed that the growth of tumors produced in experimental animals could be partially inhibited.<sup>9-11</sup> However, cures were the exception. Small doses seemed even to increase the rate of growth.

Our present knowledge of the biophysical effects of ultrasonic energy on tissue is still far from complete. However, considerable progress has been made during recent years.<sup>12-17</sup> Therefore, it seemed to be worth while to study the therapeutic significance of the effects on tumor tissue of those reactions in the ultrasonic field which are at least partially understood.

Three main types of biophysical reactions had to be considered: Those reactions which are secondary to the occurrence of cavitation (gaseous cavitation, degassing or related phenomena); reactions produced by ultrasonic phenomena, which are not due to the occurrence of cavitation or to the rise of temperature as a result of absorption (the mechanism and the therapeutic significance of these reactions are poorly understood as yet); and reactions which

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resulted from the rise in temperature in the tissues owing to absorption of ultrasonic energy.

### Cavitation

It has been demonstrated that vaporous cavitation occurs in tissues only at ultrasonic intensities which are far above those used in ultrasonic therapy.<sup>30,31</sup> However, it was also found that gaseous cavitation (degassing and related phenomena) occurs in tissues and even in the living animal at levels of intensity not much higher than those used in ultrasonic therapy.<sup>32-34</sup> These phenomena which are associated with cavitation are of a highly destructive nature, the cells in the vicinity of the cavities or bubbles being completely destroyed. These effects rapidly diminish with increasing distance from the centers of the reactions.<sup>35-37</sup> They are spotty and damage to the tissues is not uniform.

Complete destruction of a tumor is to be expected from ultrasonic energy only if the areas of damage around the cavities or bubbles are so close to each other that they are confluent. To accomplish complete destruction, it is obvious that the ultrasonic intensity must be increased as much as possible. This increase must be limited because it is necessary to control the rise of temperature in the tissues. Simple burning of the tissues should be prevented. It does not seem advisable to lower the ultrasonic frequency in order to facilitate the occurrence of cavitation or related phenomena, since the decrease in frequency is accompanied by an increase of the divergence of the ultrasonic beam. With this divergence, limitation of treatment to the site of tumor growth becomes more difficult. Application of pulsed ultrasonic energy permits the use of high intensities without corresponding rise of temperature, but may decrease the occurrence of cavitation.

In order to study the therapeutic significance of the destructive effects of cavitation (gaseous type, degassing or related phenomena), it seemed advantageous to use a tumor which can be grown as a cell suspension as well as

solid tissue. It is known that cavitation occurs more readily in cell suspensions with a low volume percentage of cells than in solid tissues.<sup>38,39</sup> Also the viscosity of the tissue fluids may influence the occurrence of cavitation.

### Nonthermal, Noncavitation Reactions

Biologic reactions have been observed which were not produced, or at least could not be explained, by the effects of cavitation or the rise of temperature in the tissues.<sup>40-42</sup> It was of interest to check whether or not any of those effects might include an inhibiting action on the growth of tumors. This could be done by exposure of the tumor to ultrasonic energy while the thermal effect of such energy was being controlled by cooling and the occurrence of cavitation was being controlled by application of pressure, and by exposure of the tumor in its solid form.

### Thermal Effects

It has been reported that tumors can be destroyed by diathermy.<sup>43</sup> However, with this procedure the temperature threshold which damages the tumor tissue is in most cases only slightly below that which injures the normal tissue and it is obvious that it would be very difficult to obtain any cure with this method. On the other hand, ultrasonic diathermy has definite advantages over the other types of application of heat.<sup>44,45-46</sup> The divergence of the sound beam is slight. It is even possible to focus the ultrasonic energy on the tumor. In addition, many tumors represent interfaces.<sup>47</sup> Such tumors possibly absorb more energy, therefore, than would be the case if there were no interface. In addition, some tumors have a high coefficient of absorption because they contain bone (osteogenic sarcoma).<sup>48,49,50,51,52-53</sup> It also is possible, when applying ultrasonic energy, to prevent any rise of temperature in the skin and subcutaneous tissues overlying the tumor. Therefore, it is conceivable that this type of diathermy may be used in combination with x-rays in order to sensitize a tumor to the irradiation with x-rays. This is conceivable

even though ultrasonic energy alone may not be able to destroy a tumor completely. Experimental investigations of the combined use of roentgen rays and ultrasonic energy have been made.<sup>22</sup> However, these early studies have been abandoned because the results were too variable.<sup>23</sup>

### Methods

In our investigations an ultrasonic frequency of 1 megacycle per second was used. The power supply of the generator was filtered and rectified (full wave rectification). The sound beam was focused by means of a polystyrene lens.<sup>24</sup> The diameter of the focus was approximately 0.4 cm. The focal intensity of ultrasonic energy was 8.4 watts per square centimeter (measured with a calibrated probe). The whole arrangement was installed within a steel chamber in which pressure (7 atmospheres) and vacuum (70 cm. of water) could be applied. Boiled water was used as a coupling medium. Cell suspensions were exposed to ultrasonic energy in a small vessel (capacity 3 cc.) with thin walls (0.01 cm.) for 1 minute. The sound beam was focused within the container, and the cell suspensions were agitated during exposure. The temperature of the fluid was kept at 20 C. The volume percentage of cells in the suspension was measured with the hematocrit, and the cell counts were taken before and after exposure. When the solid tumors (previously produced in the tails of mice) were exposed for 4 minutes, the sound beam was focused on those parts of the tails which carried the tumor. The body of the mouse was above the water and therefore not exposed to any ultrasonic energy. In some experiments the temperature of the water was 30 C., while in others an appreciable rise of temperature in the tail was prevented by cooling during exposure to ultrasonic energy (water temperature 5 to 10 C.).

Erllich's ascitic carcinoma of the mouse was grown either as an ascitic tumor or as a solid tumor in the mouse tail. A tenth of a cubic centimeter of ascitic fluid, containing approximately 150,000

cells per cubic millimeter, was injected into the middle of the tail. Eight days later the experiments were started. The tumor was measured with a caliper at intervals of two days. Fourteen days after exposure to ultrasonic energy it was noted whether the tumor had decreased or increased in size since the start of the experiment. If pressure were applied it was reduced slowly (10 minutes). The tumors were also examined histologically.

X-rays were applied (135 kv, filter 0.45 cm. of aluminum, 165 r per minute) in such a fashion that the tails were exposed in water (2 cm. deep, 20 C.). The doses stated in figure 2 were measured for air. The body of the mouse was completely shielded with lead (thickness, 1 cm.). When ultrasonic energy and x-rays were both applied, the ultrasonic treatment preceded that with x-rays by 15 minutes.

### Experiments

In order to study the role of cavitation (gaseous cavitation, degassing or related phenomena) suspensions with different volume percentages of tumor cells were exposed to ultrasonic energy. Heating was prevented by cooling. The results (fig. 1) show that the destruction of cells rapidly decreased with increase of the volume percentage of cells. If we may extrapolate, comparing such a curve to the volume percentage of cells in the solid tumor, we might conclude that a major destructive effect, as a result of cavitation, cannot be expected. It may also be assumed that destruction of cells as observed in these experiments is due to the occurrence of cavitation since both phenomena are inhibited by application of pressure and vacuum (fig. 1).

Next an attempt was made to find out whether or not destruction of tumor cells could be produced when the occurrence of cavitation (gaseous type, degassing or related phenomena) and the thermal effects of ultrasonic energy were prevented. The tumor cells (40 volumes per cent) were suspended in the ascitic

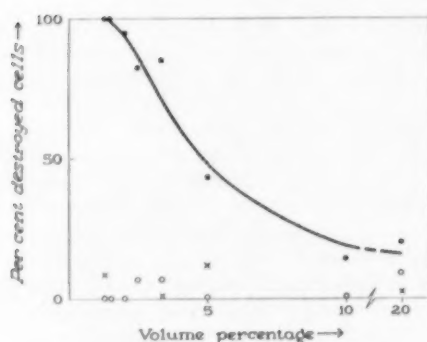


Fig. 1—The percentage of tumor cells destroyed is plotted against the volume percentage of cells in the suspension. The suspension was exposed to 8.4 watts per square centimeter of ultrasonic energy for 1 minute. The ultrasonic frequency was 1 megacycle, and the temperature of the suspension was 20 C. The various pressures at which the cell suspension was exposed to ultrasonic energy are indicated by symbols as follows: dots, atmospheric pressure; circles, pressure of 7 atmospheres; and x's, vacuum of 70 cm. of water. Every point represents an average of 10 experiments.

fluid and exposed to ultrasonic energy for 30 minutes (10 experiments). Pressure (7 atmospheres) was applied during irradiation. The high pressure, the high volume percentage of cells and the viscosity of the suspension fluid inhibited the phenomena of cavitation. A rise of temperature above 20 C. was prevented by cooling. No cell destruction was observed as a result of exposure to ultrasonic energy. Part of the cell suspension (0.1 cc.) was injected into the abdomen of ten mice before and part of it (0.1 cc.) after the treatment with ultrasonic energy. An ascitic tumor developed in each mouse. The mice of the control group died on the fourth to fifteenth day after injection. The mice injected with the cells exposed to ultrasonic energy died between the fourth and thirteenth day after injection. These observations seemed to indicate that ultrasonic energy had not impaired the viability of the tumor cells. In conclusion, no evidence could be found in these experiments that nonthermal or noncavitation effects of ultrasonic energy exist which destroy the tumor cells or impair their potential growth.

The conclusions drawn from the de-

scribed experiments were checked for validity by another set of experiments. The solid tumor was grown in the tails of mice. The tumors were exposed to ultrasonic energy for 4 minutes. The following experiments were performed: 10 mice were treated with ultrasonic energy under atmospheric pressure and 10 were treated under a pressure of 7 atmospheres. A biologically effective rise of temperature in the tumor was prevented by cooling. Ten controls were exposed to the pressure without ultrasonic treatment. Ten mice served as controls and were not subjected to any treatment. Five mice out of each experiment were killed immediately after the experiment and the tail fixed for further histologic examination. The remaining 5 mice of each experiment were killed after 4 days. The histologic examination did not show any significant difference between the appearance of the tumors of the different groups. Hemorrhages and necrosis were common findings in all tumors. It is possible that there was an insignificant increase of the occurrence of both hemorrhage and necrosis in the group treated with ultrasonic energy under atmospheric pressure. This may have been due to the occurrence of a few cavitation bubbles. Generally, however, the findings confirmed the assumption that cavitation is largely inhibited by the high-volume percentage of cells and that there are no major therapeutically significant non-thermal or noncavitation effects which destroy the tumors or inhibit their further growth. These observations are in agreement with observations that there is no significant destruction of tumor beyond the necrosis due to overheating of the tissues.<sup>20,21</sup> The findings also check well with previous ones that cavitation occurs only sporadically in normal tissues. Even a fourfold increase of the ultrasonic intensity has not changed this fact.

Finally, the therapeutic significance of the thermal effect was investigated. Since the possibility of destroying a tumor with heat alone is slight<sup>22</sup> and worth investigating only in those cases in



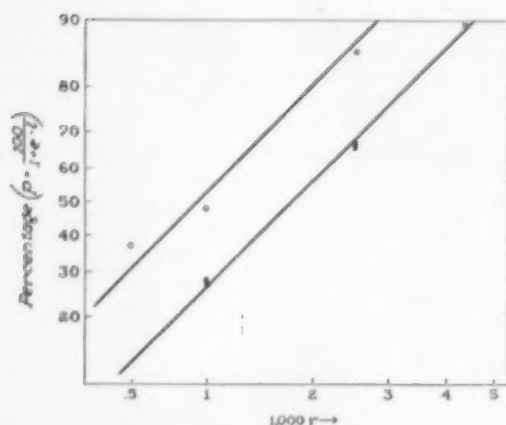


Fig. 2—The percentage of mice in which a regression of tumor growth occurred is plotted against the dose of x-rays (scale according to Berkson).<sup>10</sup> Each point represents the percentage in 30 to 50 animals. Key: x's, treated with x-rays only; circles, treated with ultrasonic energy at 30 C. and x-rays; and dots, treated with ultrasonic energy at 5 to 10 C. and x-rays.

which selective rise of temperature as a result of a specific absorption of ultrasonic energy occurs in the tumor,<sup>11</sup> we studied the possible effectiveness of a combination of ultrasonic and x-ray therapy. The possibility of increased effectiveness of such combined therapy was suggested by early clinical investigations which seemed to indicate that regression of the growth of tumors was apparently greater when ultrasonic energy was applied in addition to x-rays.<sup>1-3</sup>

The tumor was treated with ultrasonic energy preceding the x-ray irradiation. A biologically effective rise of temperature in the tissues was permitted. The temperature of the water bath was 30 C. The results, as demonstrated in figure 2, show that the effect of x-rays is definitely increased by the application of ultrasonic energy. The increase of the percentage of occurrence of regression of the growth is approximately 20. When the dosage of x-rays which produced this regression of the tumor in 50 per cent of the animals was considered, it was apparent that approximately 50 per cent of the x-ray dose could be saved by the preceding ultrasonic treatment. None of the 50 controls showed a decrease of the size of the tumor beyond that at the

start of the experiments. Furthermore, no regression of the growth was obtained under the conditions of the experiment on 30 animals, at least, by ultrasonic treatment alone regardless of whether the temperature of the water was 5 to 10 C. or 30 C. In only 2 animals was there an immediate necrosis with gross interruption of the circulation and petechial hemorrhage. It is conceivable that these changes resulted from a cavitation bubble. When a rise of temperature in the tumor was prevented by cooling, the results of the subsequent x-ray treatment could not be distinguished from those obtained by x-rays alone. This suggested that the increase of efficiency of the x-ray treatment when combined with ultrasonic treatment was owing to the thermal effect or to reactions largely dependent on temperature.

### Conclusions

At present there is no definite indication that ultrasonic energy will have a future place in the therapy of cancer.

The destructive phenomena of cavitation occurred only sporadically in the solid tumors under the conditions of the experiments (ultrasonic intensity up to 8.4 watts per square centimeter, frequency 1 megacycle per second). The occurrence of cavitation (gaseous type, degassing or related phenomena) was largely inhibited by the high-volume percentage of cells in the tissues. It is doubtful whether changing of the experimental conditions could improve these results.

No evidence could be found in the experiments that nonthermal, noncavitation reactions of therapeutic significance occurred under the given conditions.

It also seems to be unlikely that the heating effect of ultrasonic energy can destroy cancerous growths without destruction of normal tissues. But, combined with x-ray therapy, ultrasonic treatment appears to increase the efficiency of the x-ray therapy. It is conceivable that this property of ultrasonic energy may be of practical value. In favor of this possibility are the following facts: (1) It is possible to apply ultra-

sonic energy without heating the skin and superficial tissues; (2) the divergence of the ultrasonic beam is comparatively slight. Therefore, it is possible to limit the treatment to the area of the tumor. Due to the favorable ratio of wave length to diameter of the radiating area of the applicator, it is even possible to focus the energy on the tumor, and it is to be expected that certain tumors, such as osteogenic sarcoma which forms bony tissue, are selectively heated because of the very high coefficient of absorption of bony tissue. Other tumors may absorb ultrasonic energy selectively because these structures represent interfaces between tissues of different acoustic impedance at which the longitudinal sound waves are converted into sheer waves.

The fact that the effects of ultrasonic energy were not at all uniform because of the nonuniformity of the intensity in the sound field, and the fact that the increase in efficiency of x-ray treatments was not a major one, are indicative of the limitations of the possible therapeutic application of ultrasonic energy in combination with x-ray irradiation. However, it is conceivable that these limiting factors can be improved by changing the experimental conditions.

Before the possible value of the thermal reactions to ultrasonic energy can be assessed, further experiments must be performed in order to obtain information on what the optimal conditions are and what the optimal therapeutic result could be.

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## IMPORTANT NOTICE TO SOCIETY MEMBERS

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The following is the report of the Committee on By-Laws of the American Society of Physical Medicine and Rehabilitation. The Committee recommends the following amendments:

### ARTICLE I—NAME

The name of this organization is the American Society of Physical Medicine and Rehabilitation, hereafter referred to as the Society.

Amend Article I, to read as follows:

The name of this organization is the American Academy of Physical Medicine and Rehabilitation, hereafter referred to as the Academy.

N.B. The Committee on By-Laws further recommends that the said By-Laws be further amended by striking the word "Society" wherever it appears therein, where said designation refers to this organization, and inserting in lieu thereof the word "Academy."

### ARTICLE III—MEMBERSHIP

Section 2—Active Members. (a) QUALIFICATIONS—To be eligible to be an Active Member, a person must be a member in good standing either of the American Medical Association or of any foreign national medical association and, in addition, must either be a licensed physician who for the preceding five years or more has limited his practice to physical medicine and rehabilitation, or be a full time professor or other instructor of one or more courses in physical medicine in a medical school or college accredited by the Council on Medical Education and Hospitals of the American Medical Association. After January 1, 1950, however, an applicant for active membership must be a certificent of the American Board of Physical Medicine and Rehabilitation.

Amend Article III, Section 2 (a), to read as follows:

To be eligible to be an Active Member, a person must be a member in good standing either of the American Medical Association or of a representative and reputable foreign national medical association and a certificent of the American Board of Physical Medicine and Rehabilitation.

Section 2—Active Members. (b) ELECTION—An eligible person may be nominated for active membership by two Active Members, one to act as proposer and the other as seconder, in writing to the chairman of the Membership Committee, supplying such information and executing such application or nomination form as the Committee shall require. At the ensuing annual session, the Committee shall report the names of all nominees received in the preceding year. At the following annual session, the Committee shall report on the qualifications of the nominees. The Committee shall not, however, present any nominee concerning whom it has received, by at least three months prior to the annual session, written objections from ten or more members, which objections, in the opinion of the Committee, are valid objections to membership. The nominees presented by the Committee shall come up in executive session for election or rejection by the membership. A nominee shall be elected on the favorable vote of two-thirds of the members present and voting.

Amend Article III, Section 2 (b), to make the third sentence thereof read as follows:

At the following annual session, the Committee shall report on the qualifications of the nominees and a vote taken thereon.

Section 3—Senior Members. (a) QUALIFICATIONS—A person who is sixty-five years of age or more and who has been an Active Member in good standing for fifteen or more years, or since the establishment of the Society or within two years thereafter is eligible to be a Senior Member.

Amend Article III, Section 3 (a), by adding a sentence at the end thereof as follows:

Senior Members are exempt from the payment of dues.

### ARTICLE VI—BOARD OF GOVERNORS

Section 1—General Powers. The Board of Governors shall carry out the mandates and policies of the Society as determined by its voting members. Subject only to the provisions of these By-Laws and to all resolutions and enactments of the voting members



passed at any executive session of any meeting, regular or special, the Board has full and complete power and authority to perform all acts and to transact all business for and on behalf of the Society and to manage and conduct all property, affairs, work and activities of the Society. The Board shall have such other powers and duties as these By-Laws may elsewhere provide and as the Society may in addition grant or impose.

Section 2—Composition. The Board of Governors consists of the President, President-Elect, Vice President, Secretary-Treasurer, and three elected governors chosen in the manner provided in Article IV of these By-Laws.

Amend Article VI, by reversing the position of Section 1 and Section 2, and renumbering accordingly.

#### ARTICLE VIII — FINANCES

Section 3—Initiation Fee and Annual Dues. An applicant elected as an Active Member shall pay an initiation fee of \$20.00. An Active Member must pay annual dues of \$5.00, which are due and payable between January 1 and March 1 of that year. Active Members whose dues are in default at the time of the annual session are subject to such disciplinary measures as the Society at that time may determine.

Amend Article VIII, Section 3, to read as follows:

An applicant elected as an Active Member shall pay an initiation fee of \$50.00. An Active Member shall pay annual dues of \$10.00, which are due and payable between January 1 and March 1 of each year. Active Members whose dues are in default at the time of the annual session are subject to such disciplinary measures as the Academy at that time may determine.

#### ARTICLE IX — OFFICIAL PUBLICATION

The official publication of the Society is the Archives of Physical Medicine, in which shall be published all official Society notices and transactions of the Society and of the Board of Governors, either in abstract or in full.

Amend Article IX, to read as follows:

The official publication of the Academy is the Archives of Physical Medicine and Rehabilitation, in which shall be published all official Academy notices and transactions of the Academy and of the Board of Governors, either in abstract or in full.

#### ARTICLE X — DISCIPLINARY ACTION

Section 1 — Clauses. For such reasons and

under such conditions as the Society by resolution may provide, the Society may enforce proper disciplinary measures on the members. Pending the adoption of such resolution or resolutions, the Society may admonish, suspend or expel if a member has committed one or more of the following acts:

(a) Unless in the case of an Active Member, payment of dues on his behalf has not been received timely in accordance with Article VIII, Section 3, of these By-Laws;

(b) If he has been suspended or expelled by his local medical society;

(c) If his license to practice medicine has been revoked or suspended and has not been subsequently restored on appeal;

(d) If he has violated the Principles of Medical Ethics of the Society; or

(e) If he has committed a crime involving moral turpitude.

Amend Article X, Section 1, to read as follows:

For such reasons and under such conditions as the Academy by resolution may provide, the Academy may enforce proper disciplinary measures on the members. Pending the adoption of such resolution or resolutions, the Academy may admonish, suspend or expel if a member has committed one or more of the following acts or if one or more of the following acts has occurred:

(a) Default in payment of dues and assessments;

(b) Suspension or expulsion by local medical society;

(c) Suspension or revocation of license to practice medicine;

(d) Violation of the Principles of Medical Ethics; or

(e) Commission of a crime involving moral turpitude.

Section 2 — Procedure. Until the Society by resolution may provide otherwise, no disciplinary action may be enforced unless there has been served by registered mail on accused member a copy of the charges preferred against him, he is given at least ten days after the service of the charges on him to prepare his defense, and a hearing is held on those charges at which he is afforded a full opportunity to be heard in his own defense. Charges may be preferred by any member with the Board of Governors, who after the hearing referred to should recommend to the next ensuing annual session admonition, suspension or expulsion as in its opinion the circumstances may indicate. In executive session, the members by three-fourths vote of those present and voting may affirm, modify or reject the recommendation of the Board and the decision of the executive session shall be final.

Amend Article X, Section 2, to read as follows:

Until the Academy by resolution may provide otherwise, no disciplinary action may be enforced unless there has been served by registered mail on the accused member, a copy of the charges against him. The accused member shall not have less than ten days after the service of the charges against him in which to prepare his answer and defense thereto. The accused member shall then be entitled to a hearing before the Board of Governors on such charges and shall be entitled to a full opportunity to be heard. Charges shall be presented in writing to the Board of Governors, who after the hearing referred to, shall recommend appropriate action to the next ensuing annual session. In executive session, the members by a three-fourths vote of those present and voting may affirm, modify or reject the recommendations of the Board of Governors and the decision of the members at such executive session shall

be final.

These amendments were submitted in accordance with Article XIII—Amendments of the By-Laws which reads as follows:

"These By-Laws may be amended at any session, annual or special, by the vote of at least two-thirds of the Active and Senior Members present and voting, provided that any proposed amendment (1) has been submitted in writing to the Secretary and (2) notice thereof has been mailed to each voting member or has been inserted in the official publication at least one month prior to the session at which it is acted on.

Respectfully submitted,  
Committee on By-Laws

Earl C. Elkins, Chairman  
Ben L. Boynton  
Miland E. Knapp  
Frederic J. Kottke  
Donald L. Rose

## The Convention Bag

. . . or, what to take for a week of meetings

By the time he gets home, the physician has a bundle of reprints and literature, a fistfull of samples, and pocketfuls of indecipherable notes; happy amidst all the recollections of a meeting, he is certain to forget a number of inconveniences and mishaps that shouldn't happen again—like *thinking* he had his toothbrush when he didn't. Here is a check list that guards against any untoward occurrence, wards off malign humors and makes packing a delight (i.e., minimizes somewhat the infernal nuisance of it). The assumption is that no convention lasts more than a week, and that you are not putting up at fabulous hostelrys where they launder your shirt in 20 minutes so that you only take along one shirt.

### Listings—A to C

Toilet articles just aren't worth collecting from the bathroom for every trip; they are far more easily *duplicated*, placed in the bag and never thought of again. A list to start with is appended as List A.

Clothes are sure to vary with season, geography and role of the conventioneer. Most physicians like an additional suit that can be pressed overnight, but some are obliged to haul formal wear besides, as a burden of celebrity, while the blessed intern or resident

who doesn't own another suit goes light in heart and baggage. Hence List B is to be checked according to resources and obligations. But the physician better see to this himself and not let his wife do it—or he will find she has been listening to the radio and has packed his snow shoes and like paraphernalia.

The allowance of shirts for the trip will depend on longevity for any one shirt; keep in mind that you can start home in a tired one, and that any shirt is tired before noon in summertime east of the Mississippi. Unless

### List A

Toothbrush  
Toothpaste, etc.  
Razor  
Razor blades (pkg.)  
Shaving soap and brush  
Comb and brush  
Shoelaces (pr.)  
Lotions, pomades,  
deodorants, p.r.n.



**List B**

Second suit  
 2 ties to match  
 Formal clothes  
     That kind of shirt\*  
     Studs and cuff links  
     Tie  
 Suspenders — Belt  
 Official regalia, lapel ornament,  
     embassy sash  
 Clothes brush  
 Rainwear or umbrella  
 Overshoes  
 Normal underwear  
 Bad-weather underwear  
 Shirts, q.s.  
 Socks, q.s.†  
 That novel you started in 1952  
 \*Quota: *How many dinners?*  
     *How many days presiding?*  
 †Bring plenty. *It is impossible*  
     *to buy socks away from home—*  
     *because no man knows what size*  
     *to buy: only his wife knows.*

previous experience is reassuring, relying on the hotel laundry service is perilous, and one may as well count on (1) buying extra shirts in town, (2) having your secretary mail a half-dozen *before* you leave or (3) carrying all you'll need all the way. In this civilization there is no headache equal to the problem of no clean shirt. At least given forethought a shirt doesn't have to be carried in the baggage on the way home. What is required is 2 large sheets of stout brown paper with an address-label already affixed, some string and a few stamps in the wallet. If the convention is less than 150 miles from home, it costs 23c to send home 2 shirts (8 oz. each), 27c for 4, and 4c for an additional 2 shirts (1 lb.). The maximum is 80 shirts (postal regulations). The finished parcel can be left at the hotel desk: even if they're sorry they don't have that many stamps, they'll direct you to the nearest post office.

What *everyone* forgets on a trip like this is a few sheets of his own stationery, with envelopes, and an extra supply of cards to hand to old classmates. The kind of notebook you want for this meeting depends on it and you, but the important thing is to have it in your coat pocket; therefore it appears in List C, things for pockets.

The list of people to call when you reach Minneapolis ought to be on the back pages of the notebook (rather than the back of an envelope), and the presents to bring home might as well be listed there also. Another thing to jot down, however foolish it may

seem, is the name and address of the hotel where your reservations are. It doesn't cost anything, and it may obviate a canvass of hotels in a strange city to discover which one it was — it seems they're all named "Copley-Waldorf" anyway. The manuscript of your paper should be in the inside coat pocket and a carbon copy in the bag; but it may not matter, as a scrupulous secretary always sends a third copy right to the hotel, to arrive the morning of your speech. The slides remain in the bag until needed, and are *never* taken out for rehearsal except in the hotel room (above all, not on trains).

**List C**

Notebook  
 Ticket and reservations  
 Timetable — Cards  
 Own stationery with  
     envelopes\*  
 Membership card  
 Numerous dimes for conserv-  
     ative (but eternal) tipping  
 \*If necessary, owing to quan-  
     tity, part can go into the  
     bag.

Now, if the trip involves pullman travel, put into the bag a few extra packs of cigarettes, some chocolate, crackers, a couple of ounces of spirits and a barbiturate, because there is nothing so woeful as being awakened by the backing and filling of locomotives in some jet-black junction and finding you're famished, as well as stiff in the joints and cold. (The cold-weather underwear may be useful here.) And don't forget to replenish these items for the trip home.

As to the bag itself, enormous trouble can be saved by attaching a tag inside it, as well as outside, specifying the name and address of the owner.

Finally, there's the question of tipping, a deadly but inescapable custom for which you may as well set aside a pocketful of dimes. This will help keep the cost of your trip within lunatic limits (though not far within), and will bolster the widespread laymen's opinion that physicians are the stingiest tipsters. Alas, people always see the value of the dollar in proportion to the labor of acquiring one. That's why the physician who parts with a whole dime, all in one place, feels expansive, if not altogether incredulous, and mutters an explanation to himself about how "You only live once!"

# MEDICAL NEWS

*Members are invited to send to this office items of news of general interest, for example, those relating to society activities, new hospitals, education, etc. Programs should be received at least six weeks before the date of meeting.*

## Fellowships for Medical Students

The National Foundation for Infantile Paralysis announces that fellowships will be available for medical students who have a minimum of eight weeks of consecutive free time for study during 1955. Three types of fellowships are offered: (1) Research in the Biological and Physical Sciences Related to Medicine; (2) Physical Medicine and Rehabilitation; and (3) Public Health and Preventive Medicine. The purpose of these fellowships is to introduce students to one of these three fields, and to enable them to determine their ability and aptitudes early in their careers. The deans of each of the approved medical schools in the United States have been asked to nominate two candidates for each of these fellowships. Students who have completed one year in medical school are eligible for the research fellowships and those who have completed two years, for the other types of fellowships. The student must be able to devote full time to the program for a minimum of two and a maximum of three months. The stipend will be \$200 a month. Students should consult with the deans of their medical schools, who will supply further information and application forms. Applications must be submitted to the National Foundation for approval before the program begins. A period of eight weeks should be allowed for administrative action by the foundation.

## Motion Picture Films

A completely revised fourth edition of "Professional Films" is now in compilation. It will include new sections providing biographical data on authors, and information on the audio-visual activities of medical schools, dental schools and graduate teaching centers.

Over 28,000 copies of previous editions are in use by medical and dental schools, Program Chairmen of State and specialty societies, and others here and abroad. AIM provides this valuable audio-visual information to the profession-at-large, without profit, as one of its contributions toward elevating

the standards of medical and dental services by expediting the dissemination of professional knowledge.

You are urged to assist directly by (1) informing film authors of this announcement so that they can write for questionnaires, or (2) providing the film title and full name and address of any film author. Write to the Academy-International of Medicine, 601 Louisiana Street, Lawrence, Kansas.

## Danger From Candy Medication

The initial report of the A.M.A. Committee on Toxicology, evaluates the dangers of candy medication. A distressing number of deaths among preschool-age children are caused by the accidental ingestion of lethal quantities of drugs. The influence of most forms of candy medication on the incidence of poisoning cannot be precisely determined because of the few data available for proper judgment. Salicylate intoxication in young children is one of the few areas in which comprehensive statistics are available.

A considerable increase in aspirin poisoning in children under five years of age has occurred with the widespread use of flavored forms of the drug. This increase is disproportionate to the increase in population in the affected age group, and it occurred after World War II when flavored aspirin became readily available as an over-the-counter remedy. The need for special children's medications that have taste and eye appeal is recognized; however, the use of packages, labeling, and dosage forms that are commonly associated with candy and that inconspicuously identify the product as a drug invite carelessness in storage and use. The public should be informed and constantly reminded that many of these products that are packaged and flavored to look like candy are in reality potent drugs, some of which can be dangerous with overdoses.

## Medicines and Drugs Deteriorate in Communist Hungary

The use of dangerous and often fatal drugs is reported in Communist Hungary by a

former health worker who recently escaped to Western Germany, the U.S. Information Agency stated in a wireless file dispatch to its overseas posts.

The Information Agency quoted the escapee as saying that while high-ranking Communists receive "luxury hospitalization" and are protected by drugs and medicines imported from the Free World, the average Hungarian is exposed to medical errors resulting from the Soviet system of Communist state control of all industry. The dispatch said: "A former Hungarian health worker declared that imperfectly compounded drugs which fail to control pain in surgery are now commonplace in Hungary. He related that Communist inefficiency has increased to such a point that 'almost entirely unreliable,' and, in many instances, 'dangerous' medicines are being distributed through official channels to the Hungarian people. One serum distributed for inoculation of children, he said, caused numerous deaths in Budapest. The health worker said he knew of doctors in Budapest—men whom I know to be sincere in their efforts—who are 'extremely apprehensive' every time they give an injection. One example of 'criminally dangerous' medicines of which he knew, he said, was marked 'glanduitrin,' one batch of which contained a substance which killed a number of persons injected with it before doctors were able to trace the reason for the disaster. The major reason for the bad medical situation, he said, is the Communist regime's speed-up emphasis and quota work competitions. The result is a situation where many Hungarian doctors fear that a prescribed medicament may do more to endanger a patient than the disease from which he suffers."

#### Camping Trips Planned

Crutches, braces and wheel chairs won't cripple the fun of thousands of boys and girls this summer. A record number of handicapped youngsters are set for the time of their lives in camping programs sponsored by crippled children's societies in every corner of the nation. Beginning in June and continuing through September, more than 7,500 crippled children will pack their braces and other appliances along with regular camping gear and set off for several weeks or more of adventure like thousands of other typical American boys and girls planning a stay at camp.

Swimming, hiking, picnics, bonfires, group projects, nature study, arts and crafts and other traditional camping activities will all be part of the program for handicapped youngsters.

#### Program For Cancer Drug Research

A national voluntary program of cooperative research and development to find and produce effective drugs for the treatment of cancer has been launched under sponsorship of the country's leading organizations and government agencies in this field of medical science.

General guidance of the program will come from the Cancer Chemotherapy National Committee. This Committee will define the scope of the program, develop general policies, assist in obtaining financial support for the work, coordinate the activities of the sponsoring organizations, and observe the rate of progress of the entire effort.

#### Atomic Medical Technics Save Career of Egyptian Singer

The U.S. Information Agency recently told the world about the recovery of Om Kalsoum Ibrahim, Egypt's first lady of song, from hyperthyroidism (toxic goiter) as the result of atomic medicines developed through U.S. medical research.

This report on Madame Ibrahim's recovery was one of a series of radio programs entitled "The Atom and You" being broadcast overseas by the Information Agency's Voice of America to demonstrate to its foreign audiences the peaceful uses of the atom and the benefits it can bring to mankind. The program was produced in English and is being translated into many of the 37 foreign languages used by the Information Agency in its international broadcasting activity.

The program was prepared with the cooperation of the U.S. Navy and doctors at the Naval Hospital in Bethesda, Maryland, where Madame Ibrahim received her treatments.

The broadcast opens in Cairo in the autumn of 1952. The doctors—Egyptian and foreign specialists—who have been treating Madame Ibrahim for hyperthyroidism, the disease that endangers a singer's career, have concluded that an operation on the diseased gland is not feasible. They have told her: "We are afraid, Madame, that Egypt's songbird will have to remain as she is . . . a silent star."

And then the scene changes. Madame Ibrahim has heard that atomic medicine offers a great promise for sufferers like herself. She has come to seek relief from her ailment at the U.S. Naval Hospital at Bethesda. Her doctor, a young atomic specialist, Lieutenant William B. Looney, is starting her treatments.

He prescribes radioactive iodine, and explains that it will race to the diseased area and bombard the thyroid with rays which will destroy enough thyroid cells to reduce



their harmful over-activity without harming the adjacent tissue.

"In effect," the American doctor explains, "you will have had the operation without risk to vital tissue."

Three months later, the script takes the Voice of America's audience to the Egyptian Embassy in Washington where Madame Ibrahim demonstrates her complete recovery by singing again.

#### Urgent Need For Nurses

Leaders in medical, hospital, health and women's groups, alarmed by the continuing urgent need for more nurses in this country, have formed a National Committee, with headquarters in Cleveland, to support House Joint Resolution 171. This bill, introduced in the House of Representatives by Frances P. Bolton, Congressman from Ohio, (also introduced into the Senate as Joint Resolution 56, by Senator H. Alexander Smith) proposes the establishment of a National Commission on Nursing Services.

The function of the Commission would be to study on behalf of the public the entire field of nursing, determine the causes for the present nursing situation, and recommend in a report to the Congress what should be done about it.

Mrs. Bolton believes this Commission would point the way to further legislation—where it is needed—for improving the health of the nation and to public understanding of areas in which the states and localities must take their own action.

Two similar national Commissions are now in operation; the Hoover Commission, studying the organization of the Executive Branch of the Government, and the Commission of Intergovernmental Relations, which is making a study of that field.

#### New Deaver Manual

The Institute of Physical Medicine and Rehabilitation of New York University-Bellevue Medical Center announced the publication of Rehabilitation Monograph IX, "Cerebral Palsy, Methods of Evaluation and Treatment," by George G. Deaver, M.D. The purpose of this monograph is to present the recent advances in the etiology, pathology, diagnosis, and types of cerebral palsy, with Dr. Deaver's interpretations of these findings, and suggested methods of evaluation and treatment. Methods of classification and evaluation of factors to determine motor disability, intelligence, hearing, vision, and speech in the infant and young child with cerebral palsy are outlined. Copies are available at the cost of \$1.00 from the Institute of Physical Medicine and Rehabilitation, 400 E. 34th St., New York 16, N. Y.

#### Fellowships in Geriatrics

The Ann Lee Home, Watervliet, New York offers two student fellowships in geriatrics this summer, which will include the opportunity to obtain practical experience in the care and management of geriatric patients. Room and board will be available. Adjacent facilities offer recreation opportunities. Application may be sent to Dr. John J. Phelan, Medical Director, Ann Lee Home, Watervliet.

#### Newly Registered Therapists

April 28, 1955

Cooke, William Robert, RFD Box 294, Ferndale, Calif.

May 23, 1955

Tomberlin, Jo Ann, 4120 Throckmorton, Dallas, Tex.

June 9, 1955

Aschbrenner, Patricia Mueller, 4375 N. 29th St., Milwaukee, Wis.

June 17, 1955

Chirby, Charles William, 104 E. Forest, Pittsburg, Kans.

Gault, Walter Ray, Box 451, Dorrance, Kans.

Gunter, Mable Ruth, 1904½ Stone St., Mobile, Ala.

Nazario, Paul, 2817 B Ramona Rd., Alhambra, Calif.

June 21, 1955

Allen, Rosella Mary, 117 Cornelia Ave., Glendale, Mo.

Barnett, Harry J., 143 E. Mistletree, San Antonio, Tex.

Bartlett, Ann Elizabeth, 4357 Leslie, Detroit

Bartosik, Sr. Mary Armella, 3800 W. Peterson Ave., Chicago

Blackburn, Sr. Mary David, Mercy Hospital, 610 N. 4th St., Burlington, Iowa

Bodner, Joan Dolores, Raynesford, Mont.

Bond, Alice Beverly, Kinderhook St., Valatie, N.Y.

Bowser, Mary Orda, RR 1, Spencerville, Ind.

Brooks, Harriette Louise, 72 West St., Danbury, Conn.

Brydon, Doris Ann, 398 Pierce, Twin Falls, Idaho

Condon, Mary Alice, 518 N. Braddock St., Mt. Vernon, Ohio

Dock, Lois Jeanne, 6081 Belleair Pl., Cincinnati, Ohio

Edsall, Fay Elizabeth, 537 Forbes St., East Hartford, Conn.

Eime, Joan Rudine, 4497 Pershing, St. Louis, Mo.

- Gaines, Mona Joy, 1317 Holly St., Blytheville, Ark.  
 Gerrie, Jean Marie, 25 Potter Rd., Scarsdale, N.Y.  
 Gervis, Ruth Susan, 33 Euclid Ave., Mt. Vernon, N.Y.  
 Gibson, Patsy Ann, 1444 Ridgewood, East Grand Rapids, Mich.  
 Glover, Willa Jean, 916 S. Market, Mt. Vernon, Mo.  
 Greenberg, Arnold I., 84 E. Morningside St., Hartford, Conn.  
 Gresczyk, Edwin George, 86 Gold St., New Britain, Conn.  
 Handville, Carolyn Joan, 155 Eastern Pkwy., Newark, N.J.  
 Hawley, Joan Ellen, Brookfield Center, Conn.  
 Heimann, Sister Marciana, PO Red Bud, Ruma, Ill.  
 Hendricks, Arlene Frances, 128 Granville St., Fairfield, Conn.  
 Hoff, Sister Mary Regina, 1325 S. Grand, St. Louis, Mo.  
 Holland, Patricia Ann, 2 W. 52nd St., Indianapolis, Ind.  
 Jackman, Richard Vincent, 133 Monmouth Ave., Waterbury, Conn.  
 Kaplan, Judith Ann, 501 5th Ave., Belmar, N.J.  
 Kelley, Julia Louise, Middletown Springs, Vt.  
 Kennedy, Duncan, 325 Senator St., Brooklyn  
 Kiegler, Joan Kathleen, Watts Hill, Honesdale, Pa.  
 Kirby, Suzanne, 4352 Broadway, Indianapolis, Ind.  
 Krumbholz, Lee Ralph, 4534 Swann, Tampa, Fla.  
 Kurt, Phyllis Mae, Box K, Cascade, Iowa  
 LeDuc, Delpha Jeanne, 405 University Dr., East Lansing, Mich.  
 Magnuson, Nancy Louise, 2137 Godwin Ave., S. E., Grand Rapids, Mich.  
 Price, Patricia Marie, 123 Wabash Ave., Brewster, Ohio  
 Raphael, Beth Jean, 221 Williamson Ave., Hillside, N.J.  
 Rosenburg, Margaret Adele, 2389 Longfellow Ave., Westfield, N.J.  
 Shambes, Georgia Marie, 230 W. Hamilton Ave., Flint, Mich.  
 Sharek, Deborah Norma, 85 Farmington Ave., Bridgeport, Conn.  
 Stuart, Gayle Carol, 590 E. Third St., Mt. Vernon, N.Y.  
 Springer, Audrey, 31631 Grand River, Farmington, Mich.  
 Tall, Beulah Sara, 275 E. 201 St., New York  
 Vance, Margaret Alton, 333 E. Lawrence, Charlotte, Mich.  
 Van Woert, Helen Augusta, 45 Western Ave., Ravena, N.Y.  
 Wayland, Nancy Elizabeth, 324 Humphrey St., New Haven, Conn.  
 Wehlmann, Harriet Ann, 2004 N. 11th St., St. Louis, Mo.  
 West, Albert M., 1384 Dixwell Ave., Hamden, Conn.  
 Yale, Harriet, 579 Yale Ave., Meriden, Conn.

Copies of many back issues of

# THE ARCHIVES

are still available.

For issues desired and prices, write to

American Congress of Physical Medicine and

Rehabilitation

30 N. Michigan Ave., Chicago 2, Ill.

## BOOK REVIEWS

*The reviews here published have been prepared by competent authorities and do not necessarily represent the opinions of the American Congress of Physical Medicine and Rehabilitation and/or the American Society of Physical Medicine and Rehabilitation.*

### OF PUBLISHING SCIENTIFIC PAPERS.

By George E. Burch, M.D. Paper. Price, \$2.75. Pp. 40, with 18 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1954.

Possibly no two persons would agree on the relative merits of any publication, but this treatise on scientific papers would win the unanimous approval of all! It originally was presented by Dr. Burch as the Presidential Address at the meeting of the Central Society for Clinical Research on Oct. 30, 1953, in Chicago.

This is an admirable little opus—sane, tolerant, humorous, and immensely informative—which anybody may read for pleasure and profit as well. It will chiefly delight the manuscript editor of a scientific journal for at last, here is delineated the legion "why's and wherefore's" of the editor's blue pencil. In fact, it gives the long-suffering editor incentive to reach for the next paper to be prepared for publication!

### THE ART OF GOOD SPEECH.

By James H. McBurney and Ernest J. Wraga. Cloth. Price, \$6.00. Pp. 584. Prentice-Hall, Inc., 70 Fifth Ave., New York 11, 1954.

*The Art of Good Speech* is much more than a compilation of the many factors involved in speech. It is liberally sprinkled with fresh observations and new approaches to problems such as listening behavior of an audience, organization of speech, language and style, and most important, the speaker as a person.

Incorporated in the text is a chapter on "The Speaking Voice." This section alone is worth the purchase price of the book. Close review of this chapter does not, of course, guarantee the reader "liquid, soothing tones" but it will make him conscious of the fact that it is never too late to learn and improve!

The authors have performed a notable service with the publication of their efforts. This book deserves a place on the book-shelf

of every individual who has occasion to meet the public at any time.

### AFTER THE DOCTOR LEAVES.

By Marguerite Clark. Cloth. Price, \$3.75. Pp. 310. Crown Publishers, Inc., 419 Fourth Ave., New York 16, 1954.

As Medical Editor of *NEWSWEEK*, the author is indeed qualified to produce a work such as this. It definitely will appeal to the non-medical person but at the same time, may possibly induce the non-medical person to attempt self-diagnosis.

It is unfortunate however, that Mrs. Clark failed to mention editorially the importance of the physiotherapist and the great strides made in medicine by these specialists. The chapter on "Disorders of the Musculo-Skeletal System" almost completely dismisses the specialty of physical medicine and rehabilitation. At the end of each chapter is listed literature and associations related to the discussion and here again, is omitted any reference to the American Congress and American Society of Physical Medicine and Rehabilitation as well as to the *Archives of Physical Medicine and Rehabilitation*.

The style is easy to read and should provide the non-medical person with a smattering of information covering various phases of medicine.

### THE PHYSICIAN AND HIS PRACTICE.

Edited by Joseph Garland, M.D. Cloth. Price, \$5.00. Pp. 270. Little, Brown & Co., 34 Beacon St., Boston 6, 1954.

Eighteen authorities have contributed to this guide for the young doctor. Although, directly focused at the practitioner just about to enter the field, these discussions will be of benefit to senior physicians as well.

Notable is the format of the book. Each essay is specifically written to outline the topic, discuss its ramifications and provide whatever solutions are necessary to the problems that daily confront the physician. All

is superbly edited, so questions are efficiently anticipated and answered.

Dr. Garland is to be commended for this fine presentation.

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**THE SEX PARADOX.** By *Isabel Drummond*. Cloth. Price, \$5.00. Pp. 369. G. P. Putnam's Sons, 210 Madison Ave., New York 16, 1954.

In light of the many books published within the last few years covering this same topic, it was difficult for the reviewer to generate any enthusiasm about this work. It is a study of the prevalent and unusual conditions relative to the law and sex in our country today.

In the preface, it is stated that the book is directed to the attention of *that sector* of the adult reading public which can materially aid the cause of good government and good citizenship where sexual matters are concerned. Miss Drummond then, has thrown down the gauntlet—but, will she find someone to accept the challenge?

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**TEXTBOOK OF HEALTHFUL LIVING.** By *Harold S. Diehl*, M.D. Fifth edition. Cloth. Price, \$6.00. Pp. 802, with illustrations. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 36, 1955.

This book is worthy of its title. It presents facts and figures regarding all aspects of Public Health. It includes a section on mental health, in addition to all phases of physical health and well being. It covers the problems of general health in a community and advances the scope to the national and international levels.

The book is written in a style easy to understand by all who may read it. It is primarily a textbook for college students in personal hygiene but could be a textbook for high school students interested in public health problems. To make it more appropriate for modern day teaching, film strips and motion pictures have been prepared to accompany, explain and visually impress students with the material. These teaching aids are available for only a few chapters.

The appendices at the end of the book are useful references for the home. Included are Tables and Standards of Weights, Food Values in Common Portions, Personal Health Record, and Control of Communicable Disease in Man. The Food Value Appendix would be helpful in establishing proper menus in the home and the Appendix on Communicable Disease might be a ready reference for families interested in the possible signs, symptoms and control of many common diseases.

One apparent weakness of the book is the use of outdated references. Much work, scientific knowledge and more recent facts have accrued which could bring these references up to date. These changes would lend more concrete authority to the written word.

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**BIOLOGICAL EFFECTS OF EXTERNAL RADIATION.** Edited by *Henry A. Blair*, Ph.D. Cloth. Price, \$7.00. Pp. 508, with illustrations. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 36; 95 Farringdon St., London, E.C. 4, 1954.

This scientific and highly technical volume is one of a series being prepared as a record of the research work done under the Manhattan Project and the Atomic Energy Commission. The entire series will consist of the declassified portion of the National Nuclear Energy Publications, which, when completed are expected to consist of approximately 60 volumes. This text represents a major portion of the work done at the University of Rochester during the war period on the biological effects of X radiation, together with a collaborative study of the chronic effects of neutron irradiation as produced at the Biochemical Foundation in Newark, Delaware.

The book is a compilation of a series of research papers and studies divided into three separate parts. The first part deals with single doses of whole body X radiation and the second part deals with the effects of chronic X radiation, while part three deals with fractionated doses of fast neutrons including procedure for this type of exposure as well as hematological and pathological effects. The book substantiates the fact, as is already evidenced in genetics, that studies of the effects of radiation extend our knowledge of biological processes beyond the limited objectives of therapeutic radiology. There is a certain amount of overlap between the workers of the several sections and fields, as well as overlap between the work and results reported from cooperating institutions. The editor's admitted purpose for the volume is to accelerate the practical exploitation of nuclear data by American science and industry, through providing scientists and engineers with as comprehensive a source of such data as is now available. Paraphrasing the words of Mr. Lewis G. Strauss, Chairman, United States Atomic Energy Commission, the work represents "A measure of American achievement to date in the field of atomic science." The volume is liberally augmented through the use of charts and photographs and there are detailed series of references at the end of each of the chapters. The amount of actual animal and laboratory experimentations which the reports represent is phenomenal and must be read to be appreciated. Each

experiment or study is summarized and the conclusions to be drawn are stated. No attempt has been made to formulize or standardize the written reports of the individual workers or groups, so that the reader has difficulty in following any single line of thought or regular format in the presentation. The volume is best regarded as a reference text with each portion or subject a complete report in itself, and with very little evidence of editorial control or continuity.

The illustrative material is largely photomicrograph, the detail of which is insufficient to permit careful study. A knowledge of higher mathematics and research methods is helpful to the reader in understanding the problems and results.

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**PROBLEMS OF AGING: TRANSACTIONS OF THE FIFTEENTH CONFERENCE.** Edited by *Nathan W. Shock*. Cloth. Price, \$4.25. Pp. 213. Josiah Macy, Jr. Foundation, New York, 1954.

This book reports the transactions of a conference on aging held on January 20-22, 1953. A group of twenty-one members and nine guests, including physiologists, anatomists, biologists, biological chemists, pharmacologists, nutritionists and pathologists discussed freely certain aspects of aging.

After a series of introductory remarks, during which each conferee indicated his own particular sphere of interest, Warren Andrew, anatomist, discussed cellular structure, Bacon F. Chow, biochemist, discussed some biochemical studies on the process of aging and F. Bourliere, biologist, discussed the role of comparative physiology in studies of aging. In conjunction with each of these three presentations, there follows a lengthy interchange of ideas among various members of the group. The book closes with a statement prepared at the request of the conference members by Clive M. McCay, nutritionist. This statement summarizes the activities of the Macy Foundation during the past seventeen years in fostering the study of problems of aging.

This book will be of particular interest to gerontologists, nutritionists and pathologists. McCay concludes that "from these meetings, no one could certainly escape without realizing that the goal of gerontology was the creation of better health in old age and not the extension of the life span. No one could escape without appreciating that old age research involves conditions quite different from those in other fields of biology including those of the intricate and inescapable intertwining of pathological and age changes as well as the great variability of men and animals in old age due to the interplay between the normal and the diseased body." He men-

tions that "if one looks at the overall philosophy that has been created as the result of the fusion of activities of the Macy Foundation, the increasing public appreciation of problems of aging, and the growing concern of government agencies over the care of the aging, one realizes that genuine gains have been made in the field of biology."

McCay states also that "the constant stress of the Macy Foundation upon the importance of bringing many disciplines to bear upon large problems is also yielding results. The whole specialized field of nutrition has come to appreciate the merits of pathology." He adds, however, that there is still much to be done and that the great problems of biological gerontology remain unsolved. "Medical school administrators still have their eyes glued on research projects dealing with diseased conditions and have little interest in projects in basic biology that attempt to determine the underlying causes of disease. Most of the American public still accepts the diseased conditions of the aged as an act of God with little chance of alleviation by any approach through basic science. However, the seeds of advanced thinking have been planted."

This is another important and interesting contribution to the problems of aging from the Macy Foundation.

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**OUR ADVANCING YEARS: AN ESSAY ON MODERN PROBLEMS OF OLD AGE.** By *Trevor H. Howell*. Cloth. Price, \$3.50. Pp. 192, with 28 illustrations. Phoenix House, Ltd., 28 William IV St., Charing Cross, London W.C. 2, 1953.

This book, one of a growing series dealing with problems of the aging, is written by a physician who is well qualified to discuss this subject. He was awarded a research grant from the Nuffield Foundation to investigate the commoner diseases of the elderly. He has directed the home for the aged sick, which is conducted under the auspices of King Edward's Hospital Fund, and also is consultant to a large hospital for the chronically sick in Croydon, England.

Howell mentions a study of more than 13,000 persons of pensionable age. Three-fifths of the older workers continued in their original activities while two-fifths had to change their type of occupation. Clerical workers showed no particular deterioration after the age of sixty. Absenteeism was less among the elderly than among the young. The study indicated definitely the usefulness of elderly workers in industry as far as regularity, accuracy and dependability were concerned. It is mentioned that loneliness is one of the greatest enemies of the older person. Most older people like to live in their accus-



tomed surroundings and "once over the age of 65, it is rather unusual for anyone to move to a new dwelling."

Howell mentions in his conclusions that the present methods employed in England for the assistance of older persons are merely palliative. The number of persons available to care for the growing numbers of elderly persons is inadequate. He concludes, therefore, that "unless the existing conditions are altered, there will gradually be less and less young people looking after more and more old ones." Howell mentions a vicious spiral of events, "starting with loneliness, diminished physical and mental activity and lack of intellectual stimulus, which often goes on from a feeling of uselessness to unhappiness and sometimes to permanent mental deterioration." He recommends, therefore, that there be "a determined attempt to solve the social and medical problems of old age." And he says, "the whole problem of old age must be tackled in a more scientific way." He concludes that until we determine what is the fundamental essence of the aging process, "we shall spend a great deal of time, money and energy to very little avail."

Although the author has not been able to provide all the answers to the problems of the aging, he has offered a challenge and has discussed thoroughly the conditions as they exist today in England. Any person interested in problems of aging can read this book with great profit.

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**AN INTRODUCTION TO PHYSICS IN NURSING.** By *Hessel Howard Flitter, R.N.* Second edition. Paper. Price, \$3.50. Pp. 208, with 100 illustrations. The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1954.

The fact that a second edition of this book appears testifies to the demand for a good physics text for students of nursing. This book which first appeared in 1948 has been considerably enlarged. The text was regrouped and examples, references, fundamental equations, list of abbreviations, etc., were added. It was brought up to date by addition of new material, notably on radiation and isotopes. These changes and additions have greatly improved the text. Although several physics books slanted towards biology and medicine have been recently published, this text is unique in that it is very successful in explaining basic principles of physics and their application to physiological processes, hospital situations and every-day life problems. While the presentation is of necessity somewhat limited in scope it is particularly well suited for the teaching of students of nursing, physical therapy and x-ray technic, the principles of a science with which they

come into contact daily. For these students the book can be highly recommended.

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**HOW TO HELP OLDER PEOPLE: A GUIDE FOR YOU AND YOUR FAMILY.** By *Julietta K. Arthur.* Cloth. Price, \$4.95. Pp. 500. J. B. Lippincott Company, 227-231 S. Sixth St., Philadelphia 5, 1954.

This is a splendid and entirely practical book with a clear objective. The author knows exactly which groups of people she is addressing and directs her discussion specifically to these groups. It is a book for guidance of the family who is confronted with the problem of caring for older persons. It has been painstakingly prepared with an abundant list of references and an extensive group of appendices of a highly informative nature. It is the most nearly complete book for guidance of lay persons in dealing with problems of aging relatives that has yet come to the attention of this reviewer.

The appendices contain useful sources of information concerning special problems including information on terminology, the Red Cross guide to care of the aging, a list of rehabilitation centers and a list of state medical associations, rules on feeding the aged, on exercise for the elderly and on the cost of hospital care, and, in addition, information on possible jobs for elderly persons. There are also lists of vocational rehabilitation offices and of clubs for older people and much more detailed information, too extensive even to mention in this review.

This book can be recommended to any family seeking information regarding problems of aging and it will be found also to be a valuable source book for every physician and health worker dealing with the problems of aging. It is recommended very highly.

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**TEXTBOOK OF MEDICINE BY VARIOUS AUTHORS.** Edited by *Sir John Conybeare, K.B.E., M.C., D.M., F.R.C.P.,* and *W. N. Mann, M.D.* Eleventh edition. Cloth. Price, \$8.00. Pp. 904, with illustrations. The Williams & Wilkins Co., Mount Royal and Guilford Aves., Baltimore 2; E. & S. Livingstone Ltd., 16 & 17 Teviot Place, Edinburgh 1, 1954.

This is a standard textbook of medicine which has survived ten previous editions which in itself is recognition of its high quality of medicine and presentation. Each section is written by a British authority in his field.

It has been revised to meet the changing world of medicine with its advances in scientific knowledge and the relative importance of these advances. However, like the assembly of all such works by the time they are

published they have already lost some ground to new advances.

There is no presentation of controversial material and no bibliography to indicate where more thorough discussions on subject matter may be found. The paper, print, ink and binding are of substandard quality for long and hard usage such as might be given a student's textbook. It is however, well presented and clearly written in English beyond reproach.

Referrals to those conditions amenable to Physical Medicine and Rehabilitation are few and so sketchily done as to be of relatively no importance. The book does not surpass any number of other good texts covering the same material at the medical student level.

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**THE ROLE OF THE PITUITARY IN CANCER.** By *Henry K. Wachtel, M.D.* Paper. Price, \$2.00. Pp. 31. The William-Frederick Press, 313 W. 35th St., New York 1, 1954.

The title and subtitle of this brochure not only suggests the importance of the theme under consideration (cancerology) but points to a new therapeutic approach by means of an original discovery of a steroid isolated by the author from the posterior pituitary body. The contents of his exposition therefore belong within the pattern always under earnest and conservative evaluation in the realm of scientific discoveries whose recognition is often restricted by the lag of time. To some readers of the ARCHIVES it will recall the review in this section (December 1938) of the impressive volume on "The Pituitary Gland" which evoked sincere but cautious praise for its scholarly content by contributors who since have risen to such international eminence as to make their name a byword of authority in endocrinology. One such an individual to cite a single example was the now familiar name of Selye and his now voluminous contributions under the title of "Stress" in his exposition of the "adaptation syndrome." The point worthy of emphasis is that time and diligent research contributed richly to our orientation of a subject that not so long ago had been regarded as heterodox and recently became recognized as one of the major constituents in the chemistry organic life.

Thus the pioneer contributions of Wachtel terminating in his recent enunciation of a steroid discovery resulting from "extensive search for a chemotherapeutic agent against cancer" will in all probability evoke divided reception. For one reason, less is known of the exact function and anatomic configuration of the posterior pituitary body than of its anterior counterpart. Convincing evidence has been adduced in proof of the presence

of antidiuretic, pressor and oxytocic hormones which apparently originate from the neurohypophysis sector, because section of these nerve fibers causes degenerative changes in the pituicytes and loss of the above mentioned hormone activity. To date, only the three mentioned hormones are recognized as originating from the posterior lobe of the hypophysis and available for clinical use, but as yet none of the active principles have been isolated in chemically pure entities.

Highly provocative therefore is the further observation and chemical analysis of Wachtel and Lustig, and Susman concerning the discovery in the posterior pituitary moiety of an acetone lipid extract from the considered gland which causes an arrest or inhibition of growth in transplanted mouse cancers. Lustig and Wachtel presented their findings in 1939 in three separate studies, published in three different languages. More recently Wachtel, now a resident in America, demonstrated some similar effects on clinical material of the application of this acetone lipid extract as to warrant its continued study on a larger scale in cancer patients under objectivity dictated by science. In substance this brochure presents studies encompassing nearly two decades of research originating in the laboratory and recently transferred to the bedside of terminal cases accompanied by unselected clinical reports that warrant extensive study and realistic affirmation of a new and challenging therapeutic approach in cancerology.

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**THE NEUROANATOMICAL BASIS FOR CLINICAL NEUROLOGY.** By *Talmage L. Peale, M.D.* Cloth. Price, \$12.50. Pp. 564, with 313 illustrations. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, 1954.

This book could just as appropriately have been called *The Neuroanatomical and Neurophysiological Basis for Clinical Neurology and Neurosurgery*, for its twenty-three chapters combine a rather complete description of the anatomy of the nervous system, as well as the function of its various components.

Two chapters are devoted to the anatomy and physiology of nerve cells and fibers, as well as pathological changes produced by injury or disease. One chapter deals with the development of the nervous system. Separate chapters are assigned to the brain, spinal cord, autonomic nervous system, brain stem, cranial nerves, vestibular system, reticular system, cerebellum, thalamus, and hypothalamus. There are detailed chapters on the cortex and fiber systems of the cerebral hemispheres, the precentral cortex and motor pathways, the extrapyramidal motor system, the prefrontal region and frontal lobes. The last five chapters deal with the general and

special senses and their pathways.

The book is based on the author's experiences as a lecturer, researcher, and clinical neurologist. Its illustrations, mostly original, contribute materially to the value of the text.

This book is recommended to students of neurology and neurosurgery. It will make an excellent reference for students and practitioners of physical medicine and rehabilitation.

**X-RAY ATLAS AND MANUAL OF ESOPHAGUS, STOMACH AND DUODENUM.** By *T.J.J.H. Meuwissen*. Leather. Price, \$25.00. Pp. 687, with illustrations. The Elsevier Press, 402 Lovett Blvd., Houston, 1955.

This monograph presents in English translation 475 case histories and 1,212 roentgenograms collected by a Dutch radiologist. The subject matter is limited to the upper gastrointestinal tract. Each major division of the text is introduced by a brief anatomico-physiological discussion and a description of the normal roentgen picture. This is followed by a concise summary of the pathological conditions of primary interest to the radiologist and the technic of radiologic examination. The major contribution consists of an orderly presentation of case histories accompanied by the radiologic evidence and its interpretation. Thus the work is essentially an atlas. Since the text is not documented the book is primarily of value to the roentgenologist with sufficient familiarity with the technical aspects of the field to assess the validity of the methods used and the deductions made.

The excellence of the illustrations warrants special commendation. The monograph is well indexed. The reference to specific illustrative cases in the introductory review of each section and the presentation of case histories and x-ray photographs on facing pages add greatly to the usefulness of the monograph.

**ACUTE ANURIA: A STUDY BASED ON RENAL FUNCTION TESTS AND ASPIRATION BIOPSY OF THE KIDNEY.** By *Claus Brun*. Paper. Pp. 215, with 62 illustrations. Ejnar Munksgaard, Norregade 6, Copenhagen K, 1954.

During the bombardments of London and other large cities in the second world war it was observed that patients with severe crush injuries of the extremities developed on acute renal disease which often ran a lethal course. The syndrome, usually called "lower nephron nephrosis" was characterized by a persistent anuria, a steadily increasing uremia, and

moderate hypertension. The period of anuria or oliguria, lasting from 8 to 14 days, was followed by a polyuric phase during which the uremia reached its peak. The acute anuria was generally followed by severe anemia which did not respond to treatment.

Following the war it became evident that acute anuric renal failure may be associated with conditions other than severe crush injuries. The syndrome has since been subjected to extensive study. The first half of Brun's monograph consists of a well documented review of the literature. The bibliography contains 179 references, more than two-thirds of which cite works published during or after the war.

The author presents 32 cases. Nearly half of the patients were submitted to differentiated renal function tests (i.e., clearance of urea, creatinine, insulin and p-aminohippuric acid). Seventeen succumbed. The morbid anatomy of both post-mortem and biopsy specimens is discussed.

Brun believes that the term "lower nephron nephrosis" is a misnomer. Tubular changes were in many cases light and in no case were found localized preferably in the distal tubules. In many specimens pathological changes were localized specifically to the epithelium of the proximal tubules. The glomeruli and the vessels were always found to be histologically normal. Biopsy demonstrated that considerable functional disturbance may occur in kidneys showing no patho-anatomical changes. Brun concludes that the evidence available supports the view that renal ischemia and anoxia are the decisive factors in the pathogenesis of acute anuric renal failure.

**HUMAN PHYSIOLOGY.** By *Bernardo A. Houssay, M.D.; Juan T. Lewis, M.D.*, et al. Second edition. Cloth. Price, \$12.00. Pp. 1177, with illustrations. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, 1955.

Without a doubt the second edition of this book is of the same high caliber as the first. The material in each section has been brought up to date without adding too much or deleting relevant facts. It is a well balanced book, adequate as a textbook and valuable as a reference to graduate medical and professional students.

The bibliography is most complete and divided with running references at the bottom of each page and a more general collection of references at the end of each chapter. In this manner it is easy to go back to the original work at any stage of study. It also eliminates a large alphabetical or numerical type listing at the end of the book.

The printing, paper and binding are of

excellent quality. The illustrations and tables are generally easy to understand although many of the descriptions are in the text and not repeated under the figure, drawing or table. This saves repetition but might be annoying to one who is studying the illustrations with a view to their value as teaching aids—such as by projection. The double column arrangement of writing saves space, but the three different sizes of type become slightly confusing and quite difficult for the presbyopic reader.

The physiology of clinical Physical Medicine and Rehabilitation is not presented. The material of interest to the physiatrist is located under the section dealing with a particular physiologic division rather than gathered together under one heading. This, however, is due to the authors' manner and style of teaching and they organize the book to meet the needs of their students. Regardless of the reviewers' minor criticisms, this is a valuable, accurate text and reference for any clinician.

# AMERICAN SOCIETY OF PHYSICAL MEDICINE AND REHABILITATION

## ANNUAL SESSION

### *Preliminary Program*

#### SCIENTIFIC SESSION

MONDAY, August 29 — 10 A.M.

##### Ballroom

Presiding — A.B.C. KNUDSON, Washington, D.C.  
Assisting — RALPH E. DE FOREST, Chicago

##### ADDRESS OF WELCOME

Harold Dinken, M.D., President  
American Society of Physical Medicine and Rehabilitation

##### An Evaluation of Some Electrodiagnostic Methods.

ROBERT W. BOYLE, M.D., Assistant Professor, Physical Medicine and Rehabilitation, Marquette University, Medical School; Director, Department of Physical Medicine and Rehabilitation, Milwaukee County General Hospital, Milwaukee, Wis.

##### Rapid Mobilization of C.V.A. Patients.

JOSEPHINE J. BUCHANAN, M.D., Assistant Professor of Medicine, School of Medicine, Georgetown University Medical School; Chief, Department of Physical Medicine and Rehabilitation, District of Columbia General Hospital, Washington, D.C.

##### The Chronically Ill and Aging — The Physiatrist's Responsibility.

MURRAY B. FERDERBER, M.D., Assistant Professor of Medicine, School of Medicine, University of Pittsburgh;  
RAYMOND F. SMITH, M.D. (by invitation), Manager, VA Hospital,  
and  
SAUL MACHOVER, M.D., Chief, Physical Medicine and Rehabilitation Service, VA Hospital, Pittsburgh.

##### Disability Evaluations.

EMIL J. C. HILDENBRAND, M.D., Associate in Surgery, Georgetown University; in charge of Neurocirculatory Clinic, Georgetown University Hospital, Washington, D.C.

#### SCIENTIFIC SESSION

MONDAY, August 29 — 2 P.M.

##### Ballroom

Presiding — GLENN GULLICKSON, Jr., Minneapolis  
Assisting — HANS J. BEHREND, New York

##### Recent Progress of Ultrasonic Therapy in Europe.

DOZENT DR. MED. KARLHEINZ F. WOEBER (by invitation), Assistant Professor, University of Bonn, School of Medicine; Hospital for Skin Diseases, Bonn (Rhein), Germany.

##### A Clinic Section of Physical Medicine and Rehabilitation.

FRANK H. KRUSEN, M.D., Professor of Physical Medicine and Rehabilitation, Mayo Foundation; Head of Section of Physical Medicine and Rehabilitation, Mayo Clinic, Rochester, Minn.

##### Hand Disabilities.

HARRIET E. GILLETTE, M.D., Director, Physical Medicine and Rehabilitation Clinic, Atlanta, Ga.

##### Afferent Influences in the Management of Spastic Paresis.

RAOUL C. PRAKI, M.D., Assistant Clinical Professor of Physical Medicine, Stanford University School of Medicine; Chief, Physical Medicine, Letterman Army Hospital,  
and  
WALTER J. TREANOR, M.D., San Francisco.

Open discussion of the papers presented during both sessions will be made from the floor.

# AMERICAN CONGRESS OF PHYSICAL MEDICINE AND REHABILITATION

## *Thirty-Third Annual Scientific and Clinical Session* Preliminary Program

### SCHEDULE OF INSTRUCTION SEMINAR

#### MONDAY, AUGUST 29

##### Peripheral Vascular and Peripheral Nerve Disease

- 9:00 Pathology of Peripheral Blood Vessels. A. James French, M.D. Ivory Room.  
10:00 Treatment of Peripheral Vascular Disease. Karl Harpuder, M.D. Michigan Room.  
11:00 Neuroanatomy of the Extremities. George C. Rinker, M.D. Ivory Room.  
2:00 Value and Limitations of Electrical Stimulation in Peripheral Nerve Lesions. Jerome Gersten, M.D. Ivory Room.  
3:00 Muscle Action Potentials: Their Cause and Measurement. Edward H. Lambert, M.D. Michigan Room.  
4:00 Electrodiagnostic Methods in Peripheral Nerve Lesions. H. D. Bouman, M.D. Michigan Room.

#### TUESDAY, AUGUST 30

- 8:00 Physics and Physiological Effects of Ultrasound with Emphasis on Its Effect on Peripheral Muscles and Nerves. Justus F. Lehmann, M.D. Ivory Room.  
9:00 Nerve Repair After Injury. E. S. Gurdjian, M.D. Ivory Room.

#### MONDAY, AUGUST 29

##### Psychiatric and Vocational Topics of Rehabilitation

- 9:00 Personality Structure and Its Effect on Reaction to Crippling Illness. John C. Nemiah, M.D. Michigan Room.  
10:00 Helpful and Harmful Attitudes of Therapists and Physicians Toward Patients. Jack Meislin, M.D. Ivory Room.  
11:00 Psychiatric Aspects of Chronic Brain Disorders and Their Importance in Physical Medicine and Rehabilitation. M. M. Frohlich, M.D. Michigan Room.  
2:00 Psychotherapeutic Effects of Exercise and Work Therapy. Ivan C. Berlien, M.D. Michigan Room.  
3:00 Vocational Aptitude Testing. Kenneth W. Hamilton, Ph.D. Ivory Room.  
4:00 Principles of Vocational Training for the Handicapped. Kenneth W. Hamilton, Ph.D. Ivory Room.

#### TUESDAY, AUGUST 30

- 8:00 The Sheltered Workshop as a Stage in Rehabilitation. Emil Trapani, Michigan Room.  
9:00 Industrial Placement of the Physically Handicapped. E. A. Irvin, M.D. Michigan Room.

### LECTURERS FOR INSTRUCTION SEMINAR

- IVAN C. BERLIEN, M.D. (by invitation), Consultant, Grace Hospital; Staff, Alexander Blain Hospital; Chairman, Committee on Preventive Psychiatry Group for Advancement of Psychiatry, Detroit.  
H. D. BOUMAN, M.D. (by invitation), Madison Wis.  
A. JAMES FRENCH, M.D. (by invitation), Associate Professor of Pathology, University Hospital, Ann Arbor, Mich.  
M. M. FROHLICH, M.D. (by invitation), Professor of Psychiatry, University of Michigan, Ann Arbor, Mich.  
JEROME W. GERSTEN, M.D., Associate Professor, Physical Medicine and Rehabilitation, University of Colorado School of Medicine, Denver.  
E. S. GURDJIAN, M.D. (by invitation), Professor of Neurological Surgery, Wayne University College of Medicine; Head of Department, University Neurosurgical Service, Grace Hospital, Detroit.

KENNETH W. HAMILTON, Ph.D. (by invitation), Assistant Director, Ohio State University Rehabilitation Center, Columbus, Ohio.

KARL HARPUDER, M.D., Attending in charge of Department of Physical Medicine, Montefiore Hospital, New York.

E. A. IRVIN, M.D. (by invitation), Medical Director, Ford Motor Company, Dearborn, Mich.

EDWARD H. LAMBERT, M.D., Ph.D. (by invitation), Associate Professor of Physiology, Mayo Foundation; Consultant in Physiology, Mayo Clinic, Rochester, Minn.

JUSTUS F. LEHMANN, M.D. (by invitation), Assistant Professor of Physical Medicine and Associate Director, Department of Physical Medicine and Rehabilitation, Ohio State University Hospital, Columbus, Ohio.

JACK MEISLIN, M.D., Chief, Physical Medicine and Rehabilitation Service, Franklin Delano Roosevelt VA Hospital, Montrose, N.Y.; Special Lecturer, College of Physicians and Surgeons, Columbia University, Department of Physical Therapy, New York.

JOHN C. NEMIAH, M.D. (by invitation), Instructor in Psychiatry, Harvard Medical School; Assistant Psychiatrist, Massachusetts General Hospital, Boston.

GEORGE C. RINKER, M.D. (by invitation), Professor of Anatomy, University of Michigan, Ann Arbor, Mich.

EMIL TRAPANI (by invitation), Institute for the Crippled and Disabled, New York.

### GENERAL INFORMATION

#### RULES GOVERNING THE READING OF PAPERS

No paper or address before the Congress shall occupy more than fifteen minutes in its delivery. The program is so arranged that all the time is utilized and it is therefore imperative that the stated time schedule be closely followed.

All papers read before the Congress shall become the property of the Congress for publication in the official journal. Each paper shall be deposited with the assisting officer of the session when read.

#### THE CONVENTION

The registration desk will be open at 8:00 a.m., Monday, August 29, for registration. It is important that everyone register before entering the convention area. Those not wearing the official badge will be refused admission. This meeting is not open to the public. No registration fee will be charged.

#### BUSINESS SESSIONS

The annual business meetings of the general membership of the Congress will be held on Tuesday, August 30, and Thursday, September 1 at 4:30 p.m.

#### CONGRESS/SOCIETY DINNER

The Congress/Society dinner will be held on Wednesday evening, August 31, at 7:00 p.m. Dress is optional. Exhibitors and guests are welcome. An interesting but brief dinner program has been arranged.

#### THE INSTRUCTION SEMINAR

Physicians as well as physical therapists who are registered with the American Registry of Physical Therapists will be permitted to register for these courses. Members in good standing of the American Occupational Therapy Association are also eligible to enroll for the seminar.

The schedule of the seminar, as arranged, will permit attendance at both the course and scientific sessions.



Each registrant for the course is allowed the choice of one lecture during a period. The charge for the complete schedule of eight lectures is \$15.00. Fewer than eight lectures may be scheduled at \$2.00 per lecture. The right is reserved to reject any application if the Committee finds it desirable to do so. Registration for specific courses cannot be guaranteed when quotas are filled.

Those who have not completed their registration for the course should do so before attending any of the lectures. No one will be admitted to any of the course lectures without the official registration card for the course. Registration for the course may be completed on Monday, August 29, starting at 8:00 a.m., at the main registration desk.

### AMERICAN SOCIETY OF PHYSICAL MEDICINE AND REHABILITATION

The American Society of Physical Medicine and Rehabilitation will hold its annual scientific session and business meeting on Monday, August 29.

#### SCIENTIFIC EXHIBITS

Scientific exhibits will be on display again and should prove of great interest. As is customary, medals will be awarded to those exhibits which are adjudged outstanding by the Committee on Awards for Scientific Exhibits and will be announced at the Congress/Society dinner.

#### TECHNICAL EXHIBITS

The program of the scientific sessions and instruction seminar has been arranged with intermission periods to allow time for visits and inspection of the technical exhibits. As these have been given considerable thought and effort, we urge every member and guest to set aside sufficient time for a complete tour of all exhibits.

Exhibits will be open from 8:30 a.m. to 5:00 p.m., Tuesday, August 30 through Thursday, September 1 till 3:30 p.m.

#### EDITORIAL BOARD

The annual meeting of the Editorial Board will be held on Sunday, August 28, 6:30 p.m.

#### AMERICAN REGISTRY OF PHYSICAL THERAPISTS

The annual meeting of the Boards of the Registry will be held on Sunday, August 28, 10:00 a.m.

#### HYDROTHERAPY GROUP

There will be a subscription luncheon meeting for the group interested in hydrotherapy on Thursday, September 1, at 12:30 p.m.

#### VETERANS ADMINISTRATION

Fourth Annual Conference of VA Chief Consultant and VA Area Consultants, Physical Medicine and Rehabilitation Service, Sunday, August 28, Parlor F, 10:00 a.m. Co-Chairmen: Dr. Donald A. Covalt and Dr. A. B. C. Knudson.

Seventh Annual VA meeting for Chiefs, Acting Chiefs, Assistant Chiefs, Staff Physiatrists, Consultants and Attending Physiatrists, Physical Medicine and Rehabilitation Service; Ballroom, Wednesday, August 31, 7:30 a.m., at breakfast. Tickets may be purchased at desk in registration area.

#### SCIENTIFIC FILMS

Several scientific films will be shown during the time of the convention.

### SCHEDULE OF DAILY ACTIVITIES

#### 33rd ANNUAL SESSION

##### SUNDAY, August 28

- 10:00 Meeting, Boards of American Registry of Physical Therapists, Parlor C
- 10:00 Meeting, Veterans Administration Consultants, Parlor D
- 6:30 Meeting and Dinner, Editorial Board, Parlor F

##### MONDAY, August 29

- 8:00 Registration, Ballroom Foyer
- 9:00 Instruction Seminar, Ivory Room

- 9:00 Instruction Seminar, Michigan Room
- 10:00 Instruction Seminar, Ivory Room
- 10:00 Instruction Seminar, Michigan Room
- 10:00 Scientific Session, American Society of Physical Medicine and Rehabilitation, Ballroom
- 11:00 Instruction Seminar, Ivory Room
- 11:00 Instruction Seminar, Michigan Room
- 12:00 Luncheon
- 2:00 Instruction Seminar, Ivory Room
- 2:00 Instruction Seminar, Michigan Room
- 2:00 Scientific Session, American Society of Physical Medicine and Rehabilitation, Ballroom
- 3:00 Instruction Seminar, Ivory Room
- 3:00 Instruction Seminar, Michigan Room
- 4:00 Instruction Seminar, Ivory Room
- 4:00 Instruction Seminar, Michigan Room
- 4:30 Annual business meeting, American Society of Physical Medicine and Rehabilitation (members only), Ballroom

#### TUESDAY, August 30

- 8:00 Registration, Ballroom Foyer—Inspection of Exhibits
- 8:00 Instruction Seminar, Ivory Room
- 8:00 Instruction Seminar, Michigan Room
- 9:00 Instruction Seminar, Ivory Room
- 9:00 Instruction Seminar, Michigan Room
- 10:00 Scientific Session, Ballroom
- 10:00 Scientific Session, Michigan Room
- 10:00 Board of Governors, Congress, Parlor B
- 12:00 Luncheon—Inspection of Exhibits
- 12:00 Luncheon, Executive Council (by invitation), Parlor C
- 12:00 Scientific Films, Ballroom
- 2:00 Formal Opening Session, Ballroom
- 4:30 First Congress business meeting (members only), Ballroom

#### WEDNESDAY, August 31

- 8:00 Registration, Ballroom Foyer—Inspection of Exhibits
- 8:00 Scientific Session, Ballroom
- 9:00 Scientific Session, Michigan Room
- 12:00 Luncheon—Inspection of Exhibits
- 12:00 Luncheon, Committee on Advances in Education, American Congress of Physical Medicine and Rehabilitation (by invitation), Parlor C
- 12:00 Scientific Films, Michigan Room
- 2:00 Scientific Session, Michigan Room
- 7:00 Congress/Society Dinner, Ballroom

#### THURSDAY, September 1

- 8:00 Registration, Ballroom Foyer—Inspection of Exhibits
- 9:00 Scientific Session, Ballroom
- 9:00 Scientific Session, Michigan Room
- 12:00 Luncheon—Inspection of Exhibits
- 12:30 Subscription Luncheon, Hydrotherapy Group, Parlor F
- 2:00 Scientific Session, Ballroom
- 4:30 Second Congress business meeting (members only), Ballroom

#### FRIDAY, September 2

- 8:00 Registration, Ballroom Foyer
- 9:00 Scientific Session, Michigan Room
- 10:00 Board of Governors, Congress, Parlor B

### GENERAL SCIENTIFIC SESSION

#### TUESDAY, August 30 — 10 A.M.

##### Ballroom

Presiding — CLARENCE W. DAIL, San Gabriel, Calif.  
Assisting — FERDINAND SCHWARTZ, Birmingham, Ala.

- 10:00 Relation of Ultrasound Effects to Orientation of Tendon in the Ultrasound Field.  
JEROME W. GERSTEN, M.D., Associate Professor, Physical Medicine and Rehabilitation, University of Colorado School of Medicine, Denver.  
Discussant: John H. Alden, Los Angeles.
- 10:30 Metabolic Cost of Ambulation in Paraplegics.  
EDWARD E. GORDON, M.D., Director, Medical Services, Institute for Crippled and Disabled; Associate Professor, Rehabilitation Medicine, College of Physicians and Surgeons, Columbia University, New York City.  
Discussant: Frederic T. Jung, Chicago.

- 10:40 Effects of High Intensity Ultrasound on Cellular Structures.**  
JUSTUS F. LEHMANN, M.D., Assistant Professor of Physical Medicine, Department of Physical Medicine, Ohio State University Hospital, Columbus, Ohio.  
Discussant: Albert A. Martucci, Abington, Pa.
- 11:00 Electrophoretic Patterns in Muscular Dystrophy.**  
MAX K. NEWMAN, M.D., Director, Physical Medicine and Rehabilitation, Detroit Memorial Hospital; Detroit Institute of Physical Medicine and Rehabilitation, Detroit.  
Discussant: Arthur A. Rodriguez, Blue Island, Ill.
- 11:20 Adaptation of Rehabilitation to Current Treatment of Tuberculosis.**  
ALBERT HAAS, M.D. (by invitation), Department of Physical Medicine and Rehabilitation, New York University College of Medicine,  
and  
HOWARD A. RUSK, M.D., Professor and Chairman, Department of Physical Medicine and Rehabilitation, New York University College of Medicine, New York City.  
Discussant: Ralph E. DeForest, Chicago.

## GENERAL SCIENTIFIC SESSION

TUESDAY, August 30 — 10 A.M.

## Michigan Room

- Presiding — RAOUL C. PSAKI, San Francisco  
Assisting — NICHOLAS D. MAURELLI, Wilkes-Barre, Pa.
- 10:00 Muscle Spasm Treated with Cycloid Vibration (Cyclotherapy).**  
WILLIAM BIERMAN, M.D., Assistant Clinical Professor of Medicine, College of Physicians and Surgeons, Columbia University, New York City.  
Discussant: Harvey K. Billig, Jr., Los Angeles.
- 10:20 The Pain Index—A Method for Determining the Progress of Treatment.**  
ALEXANDER KOPPEL, M.D., Albert Einstein Medical Center, Philadelphia.  
Discussant: Herman L. Rudolph, Reading, Pa.
- 10:40 Painful Shoulder Syndrome Following Cardiac Surgery.**  
EDWARD J. LORENZE, III, M.D., Burke Foundation, White Plains, N.Y.  
Discussant: A. Ray Dawson, Richmond, Va.
- 11:00 Symptoms Arising from the Cervical and Upper Thoracic Spines.**  
JOHN McM. MENNELL, M.B., Consultant in Physical Medicine, Woodrow Wilson Rehabilitation Center, Fishersville, Va.  
Discussant: Dominic A. Donio, Allentown, Pa.

## GENERAL SCIENTIFIC SESSION

TUESDAY, August 30 — 2 P.M.

## Ballroom

- Presiding — WILLIAM D. PAUL, Iowa City  
Assisting — FRANCES BAKER, San Mateo, Calif.

OPENING OF THE 33rd  
ANNUAL SESSION

## INVOCATION

## ADDRESS OF WELCOME

- 2:00 PRESIDENTIAL ADDRESS.**  
WILLIAM D. PAUL, M.D., Professor of Internal Medicine; Chairman, Division of Physical Medicine, College of Medicine, University of Iowa, Iowa City.
- 2:40 Symposium: Rehabilitation of the Injured Worker.**  
Moderator, HOWARD A. RUSK, M.D., Director, Institute of Physical Medicine and Rehabilitation, New York City.

## Participants:

**Mobilization Schedule of Common Fractures.**  
C. LESLIE MITCHELL, M.D. (by invitation), Chief, Division of Orthopedics, Henry Ford Hospital, Detroit;

**The Amputee in Industry — A Follow-up Study.**  
CHARLES LONG, II, M.D., Chief, Division of Physical Medicine and Rehabilitation, Henry Ford Hospital, Detroit;

**Testing and Training Work Capacity.**  
BRUCE H. YOUNG, M.D. (by invitation), Director, Workmen's Compensation Board Rehabilitation Center, Malton, Ont., Canada.

## INTERMISSION

**The Industrial Physician in Rehabilitation.**  
E. A. IRVIN, M.D. (by invitation), Director, Medical Department, Ford Motor Company, Detroit;

**Management's Problems in Placement of Handicapped Workers.**  
EARL R. BRAMBLETT (by invitation), Industrial Relations Department, General Motors Corporation, Detroit;

**The Role of the Federal Government in Vocational Rehabilitation.**  
MARY SWITZER (by invitation), Director, Office of Vocational Rehabilitation, Department of Health, Education and Welfare, Washington, D.C.

## INTERMISSION

**Panel Discussion**  
Moderator, DONALD L. ROSE, M.D., Professor of Physical Medicine and Rehabilitation, University of Kansas School of Medicine, Kansas City, Kans.

Panel members consist of symposium participants.

## GENERAL SCIENTIFIC SESSION

WEDNESDAY, August 31 — 9 A.M.

## Ballroom

- Presiding — LOUIS B. NEWMAN, Chicago  
Assisting — OJON F. von WERSBOWETZ, Gonzales, Texas

**9:00 Symposium: Contribution of Psychiatry to Physical Medicine and Rehabilitation.**  
Moderator, JACK MEISLIN, M.D., Franklin D. Roosevelt VA Hospital, Montrose, N.Y.

## Participants:

WM. BENHAM SNOW, M.D., Department of Physical Medicine and Rehabilitation, College of Physicians and Surgeons, Columbia University, New York City;

A. RAY DAWSON, M.D., McGuire VA Hospital, Richmond, Va.;

JOHN C. NEMIAH, M.D. (by invitation), Instructor in Psychiatry, Harvard Medical School; Assistant Psychiatrist, Massachusetts General Hospital, Boston,

and  
SAUL H. FISHER, M.D. (by invitation), Assistant Clinical Professor of Psychiatry, New York University College of Medicine, New York City.

## GENERAL SCIENTIFIC SESSION

WEDNESDAY, August 31 — 9 A.M.

## Michigan Room

- Presiding — PAUL A. NELSON, Cleveland  
Assisting — WILLIAM J. LA JOIE, Phoenix, Ariz.

- 9:00 Productive Living for the Cardiac Patient.**  
LOUIS B. NEWMAN, M.D., Chief, Physical Medicine and Rehabilitation Service, VA Research Hospital;
- REUBEN R. WASSERMAN, M.D., Psychiatrist, Physical Medicine Rehabilitation Service, VA Research Hospital,
- and  
CRAIG BORDEN, M.D. (by invitation), Chief of Medical Service, VA Research Hospital, Chicago.  
Discussant: Erma Smith, Broadview, Ill.

- 9:20 **Visual Space Perception and Rehabilitation of the Hemiplegic.**  
MIECZYSLAW PESZCZYNSKI, M.D., Assistant Professor of Physical Medicine and Rehabilitation, Western Reserve University School of Medicine; Chief, Department of Physical Medicine and Rehabilitation, Highland View Hospital, Cleveland, and  
JAN H. BRUELL, Ph.D. (by invitation), Assistant Professor of Psychology, Western Reserve University School of Medicine, Cleveland.  
Discussant: Harry H. Samberg, Des Moines, Iowa.
- 9:40 **Isotophorens to Prevent Gangrene Following Levator-ternoel Extravassation.**  
OSCAR O. SELKE, Jr., M.D., Assistant Professor, Physical Medicine and Rehabilitation, Baylor College of Medicine, Houston, Texas.  
Discussant: John J. Lorentz, Boston.
- 10:00 **Further Studies of Venous Circulation of the Lower Extremity. Using a Radioactive Tracer.**  
HARRY T. ZANKEL, M.D., Chief, Physical Medicine Rehabilitation Service, Crile VA Hospital;  
RICHARD E. CLARK, B. S. (by invitation), Physicist, Radioisotope Unit,  
and  
REGINALD A. SHIPLEY, M.D. (by invitation), Director, Radioisotope Unit, Crile VA Hospital, Cleveland.  
Discussant: Everill Fowles, Oswego, Ore.
- 10:20 **Clinical Electromyography.**  
BERNARD J. DOYLE, M.D., VA Hospital, Boston.  
Discussant: George W. Gelsa, Waltham, Mass.
- 10:40 **Tissue Temperatures Produced by the Application of Moist Air.**  
JAMES W. RAE, Jr., M.D., Associate Professor of Physical Medicine and Rehabilitation; Chairman, Department of Physical Medicine and Rehabilitation, University Hospital;  
CAROL E. GOODMAN, M.D. (by invitation), Resident, Department of Physical Medicine and Rehabilitation, University Hospital,  
and  
ALMA J. MURPHY, Ph.D. (by invitation), Research Assistant, Department of Physical Medicine and Rehabilitation, University of Michigan, Ann Arbor, Mich.  
Discussant: Harold Dinken, Denver.
- 11:00 **Relationships Between Measurements of Muscular Force and Manual Grade Evaluations.**  
WILLIS C. BEASLEY, Ph.D. (by invitation), Research Biophysicist in Physical Medicine, Children's Hospital, Washington, D.C.  
Discussant: To be announced.

## GENERAL SCIENTIFIC SESSION

WEDNESDAY, August 31 — 2 P.M.

### Ballroom

- Presiding — JAMES W. RAE, Jr., Ann Arbor, Mich.  
Assisting — HARRIET E. GILLETTE, Atlanta, Ga.
- 2:00 **Symposium: Rehabilitation Centers**  
Moderator, NILA KIRKPATRICK COVALT, M. D., Medical Director, Rehabilitation Center of Central Florida, Orlando, Fla.
- Components of a Rehabilitation Center: Interpretation in Relation to Federal Legislation.**  
HENRY REDKEY (by invitation), Consultant on Rehabilitation Centers, Office of Vocational Rehabilitation, Department of Health, Education and Welfare, Washington, D.C.;
- Organization and Administration of a Rehabilitation Center.**  
VIVIAN SHEPHERD (by invitation), Executive Director, The Rehabilitation Institute, Kansas City, Mo.;
- The Liberty Mutual Rehabilitation Program.**  
W. SCOTT ALLAN (by invitation), Supervisor of Medical Service, Liberty Mutual Insurance Company, Boston;
- Integration of a Center Program with Community Agencies.**  
WILLIAM F. STEARNS, A.M. (by invitation), Executive Director, Saranac Lake Rehabilitation Guild, Inc., Saranac Lake, N.Y.;

### Training Program for Rehabilitation Center.

WILLIS C. GORTHY (by invitation), Director, Institute for the Crippled and Disabled, New York City;

### Responsibility and Functions of Physicians in a Rehabilitation Center.

RALPH E. WORDEN, M.D., Director, Ohio State University Rehabilitation Center, Columbus, Ohio;

### Business Practices in Rehabilitation Centers.

ARTHUR A. RODRIGUEZ, M.D., Clinical Associate Professor of Physical Medicine and Rehabilitation, Stritch School of Medicine of Loyola University, Chicago;

### Relationships and Integration of Centers.

H. WORLEY KENDELL, M.D., Medical Director, Institute of Physical Medicine and Rehabilitation, Peoria, Ill.,

### Summary of Reports and Studies Conducted by Conference on Rehabilitation Centers.

KENNETH W. HAMILTON, Ph.D. (by invitation), Associate Director, Ohio State University Rehabilitation Center, Columbus, Ohio.

## GENERAL SCIENTIFIC SESSION

THURSDAY, September 1 — 9 A.M.

### Ballroom

- Presiding — EDWARD M. KRUSEN, JR., Dallas  
Assisting — MURRAY B. FERDERBER, Pittsburgh
- 9:00 **Prevention of Shoulder Deformity.**  
HERMAN J. FLAX, M.D., Chief, Physical Medicine and Rehabilitation Service, San Patricio VA Hospital, Sauter, Puerto Rico.  
Discussant: Solomon Winokur, New Orleans.
- 9:20 **Unusual Sites of Rheumatoid Arthritis.**  
ARTHUR E. GRANT, Capt., MC, Staff Physician, Physical Medicine Service, Letterman Army Hospital;  
WALTER J. TREANOR, Capt., MC, Assistant Chief, Physical Medicine Service, Letterman Army Hospital,  
and  
RAOUL C. PSARI, Lt. Col., MC, Chief, Physical Medicine, Letterman Army Hospital, San Francisco.  
Discussant: Thomas F. Anderson, Hanover, N.H.
- 9:40 **Rehabilitation of the Aphasic Patient.**  
EARL F. HOEHNER, M.D., Associate Medical Director, Kessler Institute of Rehabilitation, Pleasant Valley Way, West Orange, N.J.  
Discussant: Florence Mahoney, Baltimore.
- 10:00 **Evaluation of Extension of the Hip.**  
MARTIN O. MUNDALE, B. S. (by invitation), Instructor in Physical Therapy, Department of Physical Medicine and Rehabilitation, University of Minnesota Medical School;  
HELEN J. HISLOP, M. S. (by invitation), Instructor in Physical Therapy, Department of Physical Medicine and Rehabilitation, University of Minnesota Medical School;  
RAYMOND J. RABIDEAU, B. S. (by invitation), Instructor in Physical Therapy, Department of Physical Medicine and Rehabilitation, University of Minnesota Medical School,  
and  
FREDERIC J. KOTKE, M.D., Department of Physical Medicine and Rehabilitation, University of Minnesota Medical School, Minneapolis.  
Discussant: Miland E. Knapp, Minneapolis.
- 10:20 **The Relationship of the Tilt of the Pelvis to Stable Posture.**  
FREDERIC J. KOTKE, M.D., Department of Physical Medicine and Rehabilitation, University of Minnesota Medical School,  
and  
WILLIAM G. KUBICEK, Ph.D. (by invitation), Department of Physical Medicine and Rehabilitation, University of Minnesota Medical School, Minneapolis.  
Discussant: Earl C. Elkins, Rochester, Minn.

INTERMISSION — INSPECTION OF EXHIBITS

- 10:30 **Management of Capsulitis of Shoulder.**  
SAMUEL S. SVERDLIK, M.D., Assistant Clinical Professor, New York University-Bellevue Medical Center; Director, Department of Physical Medicine and Rehabilitation, St. Vincent's Hospital, New York City.  
Discussant: David M. Paul, Iowa City.

## GENERAL SCIENTIFIC SESSION

THURSDAY, September 1 — 9 A.M.

## Michigan Room

Presiding — ALLEN S. RUSSEK, New York City  
Assisting — JEROME WEISS, Brooklyn

- 9:00 **Appraisal of Patient Goal in Community Rehabilitation Center.**  
KEITH C. KEELER, M.D., Director, Rehabilitation Center of Summit County, Inc., Akron, Ohio.  
Discussant: Herbert Kent, Wichita Falls, Texas.
- 9:20 **Bowel Training in a Rehabilitation Center.**  
SEBASTIAN MEAD, M.D., Medical Director, California Rehabilitation Center, Vallejo, Calif.  
Discussant: Murray B. Ferderber, Pittsburgh.
- 9:40 **A Program of Physical Medicine and Rehabilitation for Rural Hospitals.**  
HENRY V. MORELEWICZ, M.D., Chronic Disease Research Institute: Physical Medicine and Rehabilitation Center, E. J. Meyer Memorial Hospital, Buffalo.  
Discussant: Lee B. Greene, Bridgeport, Conn.
- 10:00 **The Development of a Physical Medicine and Rehabilitation Service in a County Hospital.**  
EUGENE MOSKOWITZ, M.D., Assistant Clinical Professor, Department of Physical Medicine and Rehabilitation, New York University College of Medicine, New York City; Director, Physical Medicine and Rehabilitation, Grasslands Hospital, Valhalla, N.Y.  
Discussant: Daniel Dancik, Huntington, N.Y.

## INTERMISSION — INSPECTION OF EXHIBITS

- 10:20 **Uses of Glossopharyngeal Breathing in the Management of the Chronic Poliomyelitis Respiratory Patient.**  
ALMA MURPHY, Ph.D. (by invitation), Research Assistant, Department of Physical Medicine and Rehabilitation, University Hospital;  
NORMAN TALNER, M.D. (by invitation), University Hospital,  
and  
DAVID DICKINSON, M.D. (by invitation), University Hospital, Ann Arbor, Mich.  
Discussant: To be announced
- 10:30 **Prescription for Crutches and Canes.**  
DUANE A. SCHRAM, M.D., Chief, Physical Medicine and Rehabilitation Service, VA Hospital, Seattle, Wash.  
Discussant: Frank J. Schaffer, Columbia, S. C.

## GENERAL SCIENTIFIC SESSION

THURSDAY, September 1 — 2 P.M.

## Ballroom

Presiding — RALPH E. WORDEN, Columbus, Ohio  
Assisting — HERMAN J. BEARZY, Dayton, Ohio

- 2:00 **Fifth John Stanley Coulter Memorial Lecture.**  
Speaker to be announced.
- 2:20 **The Relationship of the Physiatrist to the Medical Profession.**  
ARTHUR C. JONES, M.D., Director, Department of Physical Medicine and Rehabilitation, University of Oregon Medical School; Medical Director, Portland Rehabilitation Center, Portland, Ore.  
Discussant: Joseph N. Schaeffer, Peoria, Ill.
- 2:40 **Usefulness of Glossopharyngeal Breathing.**  
CLARENCE W. DAIL, M.D., Associate Professor of

Physical Medicine, School of Medicine, College of Medical Evangelists;  
LEONARD V. WENDLAND, Ph.D. (by invitation), Department of Physical Medicine, College of Medical Evangelists,

and  
JOHN E. AFFELDT, M.D. (by invitation), Department of Internal Medicine, College of Medical Evangelists, Los Angeles.

Discussant: O. Leonard Huddleston, Santa Monica, Calif.

- 3:00 **Comparative Heating Effects of Moist Air and Hydrocollator Hot Packs.**

WILLIAM J. ERDMAN II, M.D., Director, Department of Physical Medicine and Rehabilitation, University of Pennsylvania,

and  
EMERY K. STONER, M.D., Department of Physical Medicine and Rehabilitation, University of Pennsylvania, Philadelphia.

Discussant: Hans J. Behrend, New York City.

- 3:20 **Some Applications of Physical Medicine in Pediatrics.**  
ARTHUR W. FLEMING, M.D., Assistant Clinical Professor of Pediatrics, Stritch School of Medicine, Loyola University, Chicago.

Discussant: Robert L. Bennett, Warm Springs, Ga.

- 3:40 **The Urinary Tract in Poliomyelitis.**

WILLIAM D. PAUL, M.D., Professor of Internal Medicine; Chairman, Division of Physical Medicine, University of Iowa;

L. J. PRENDERGAST, M.D. (by invitation), Instructor in Department of Urology, University of Iowa,

and  
B. L. WASTE, B. S. (by invitation), University of Iowa, Iowa City.

Discussant: Donald A. Covatt, New York City.

- 4:00 **Rehabilitation: An International Problem.**

HOWARD A. RUSEK, M.D., Professor and Chairman, Department of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center, New York City.

Discussant: Frank H. Krusen, Rochester, Minn.

## GENERAL SCIENTIFIC SESSION

FRIDAY, September 2 — 9 A.M.

## Ballroom

Presiding — A. RAY DAWSON, Richmond, Va.  
Assisting — HERBERT PARK, Richmond, Va.

- 9:00 **The Cost of a Comprehensive Program for Cerebral Palsy in a Community.**

PAUL A. NELSON, M.D., Head, Department of Physical Medicine and Rehabilitation, Cleveland Clinic Foundation,

and  
ROBERT DEAN MERCER, M.D. (by invitation), Head, Department of Pediatrics, Cleveland Clinic Foundation, Cleveland.

Discussant: Isadore Levin, Washington, D.C.

- 9:20 **Experiences with Bobath Method of Treatment of Cerebral Palsy.**

ODON F. von WERSBOWETZ, M.D., Medical Director, Gonzales Warm Springs Foundation;  
EMPRESS Y. ZEDLER, Ph.D. (by invitation), Director of Speech and Hearing Clinic, Southwest Texas State Teachers College, San Marcos; Consultant in Speech and Hearing Therapy, Gonzales Warm Springs Foundation;

CHRISTINE V. BURTON, O.T.R. (by invitation), Staff Therapist, Occupational Therapy Department, Gonzales Warm Springs Foundation,

and  
HECTOR D. LOZANO, B. S. (by invitation), Physical Therapist, Gonzales Warm Springs Foundation, Gonzales, Texas.

Discussant: Harriet E. Gillette, Atlanta, Ga.

- 9:40 **Skin Temperature Studies in Recting Bed Treatment with Peripheral Vascular Disease Cases.**

ISRAEL MURR, M.D., Chief, Physical Medicine and Rehabilitation Service, VA Hospital, Louisville, Ky.  
Discussant: Jerome Welsa, Brooklyn.

- 16:00 **The Problem of the Long Term Respirator Patient.**  
HAROLD N. NEU, M.D., Professor of Medicine,  
Creighton University School of Medicine; Director  
of Rehabilitation, Creighton Memorial St. Joseph's  
Hospital, Omaha.  
Discussant: Herman J. Beazley, Dayton, Ohio.

- 19:20 **Hemiplegia: its incidence and its Association with  
Aphasia and Fractures within a Chronic Disease  
Hospital.**  
EUGENE J. ROGERS, M.D., Instructor, New York  
Medical College, Flower and Fifth Ave. and Metro-  
politan Medical Center, Department of Physical  
Medicine and Rehabilitation, New York City.  
Discussant: To be announced

#### INTERMISSION — INSPECTION OF EXHIBITS

- 11:00 **Expanding Concepts in Industrial Therapy.**  
J. L. RUDD, M.D., Chief, Physical Medicine and  
Rehabilitation, Brockton VA Hospital, Brockton,  
Mass.; Chief, Physical Medicine and Rehabilitation,  
Boston City Hospital, Boston.  
Discussant: Ben L. Boynton, Chicago.

- 11:20 **Rehabilitation of the Handicapped Child.**  
JEROME S. TOBIS, M.D., Professor and Director,  
Department of Physical Medicine and Rehabilitation,  
New York Medical College, Flower and Fifth  
Ave. Hospitals; Director, Department of Physical  
Medicine and Rehabilitation, Bird S. Coler Hospi-  
tal, New York City.  
Discussant: To be announced

- 11:40 **The Influence of Cycloid Vibrations (Cyclotherapy) on  
Local Tissue Temperatures and on Radioactive So-  
dium Clearance in the Living Human.**  
LAWRENCE H. WISHAM, M.D. (by invitation),  
Associate Physiatrist, Mt. Sinai Hospital;  
ALEXANDER SHAANAN, M.D. (by invitation), Re-  
search Assistant, Mt. Sinai Hospital,  
and  
WILLIAM BIERMAN, M.D., Assistant Clinical Pro-  
fessor of Medicine, College of Physicians and Sur-  
geons, Columbia University; Attending Physiatrist,  
Mt. Sinai Hospital, New York City.  
Discussant: Robert C. Darling, New York City.

### SUPPLEMENT

Papers here listed will be read by title. All papers in this group will be submitted for publication in the ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION.

1. **Industrial Noise and How to Deal With It.** HOWARD A. CARTER, Chicago.
2. **Painful Shoulder: A Psycho-Somatic Manifestation.** A. RAY DAWSON, M.D., Richmond, Va.
3. **The Prevention and Treatment of the Frozen Shoulder.** EVERILL W. FOWLES, M.D., Oswego, Ore.
4. **Physical Therapy in Rheumatoid Arthritis.** EPHRAIM GOLDFAIN, M.D., Oklahoma City.
5. **Management of the Respirator Patient.** HERBERT KENT, M.D., Wichita Falls, Texas.
6. **Therapy and Rehabilitation.** CHARLES H. REAGAN, M.D., Tuscaloosa, Ala.
7. **Gait Training in Children with Residuals of Poliomyelitis.** ODON F. von WERSOWETZ, M.D., Gonzales, Texas.

### SCIENTIFIC EXHIBITS

**Quantitative Muscle Testing—Methods and Statistics.** WILLIS C. BEASLEY, Ph.D.

**The Rehabilitation of Binocular Vision by Orthoptic Exercises.** HERMAN M. BURIAN, M.D., ELSIE H. LAUGHLIN, R.N., and JOSEPHINE KUKORA, R.N.

**Rehabilitation Centers in the United States.** NILA KIRKPATRICK COVALT, M.D.

**Michigan Crippled Children Commission (State of Michigan Juvenile Amputee Program).** CARLETON DEAN, M.D.

**American Occupational Therapy Association.**

**Lower Extremity—Temporary Training Prostheses (Pylon).** MAXWELL D. FLANK, M.D.

**Armless Children.** EARL F. HOERNER, M.D.

**Physical Medicine in Gynecology and Obstetrics.** A. P. HUDGINS, M.D.  
**American Board for Certification Program: Certification in the Artificial Limb and Brace Field: A Service to the Physiatrist and His Patients.** GLENN E. JACKSON and LESTER A. SMITH.

**Artificial Ionization of the Air.** IGHO H. KORNBLUEH, M.D., JAMES E. GRIFFIN, M.A., and J. C. BECKETT, M.A.

**Electrophoretic Patterns in the Myopathies and Neuromyopathies.** MAX K. NEWMAN, M.D.

**Muscular Dystrophy.** WILLIAM D. PAUL, M.D., MAX K. NEWMAN, M.D., and J. I. ROUTH, Ph.D.

**Strumpell-Marie Arthritis.** WILLIAM D. PAUL, M.D., DAVID M. PAUL, M.D., and J. I. ROUTH, Ph.D.

**The National Society for Crippled Children and Adults, Inc.**

**Muscular Dystrophy Associations Medical Exhibit.** MORTON D. SCHWEITZER, Ph.D.

**Rehabilitation of Poliomyelitis Patients with Respiratory Involvement: National Foundation for Infantile Paralysis.** HART E. VAN RIVER, M.D.

**Effects of Electric Stimulation on Denervation Atrophy.** K. G. WAKIM, M.D. and P. H. KRUSEN, M.D.

**New Architectural Developments in Physical Medicine and Rehabilitation Facilities.** RALPH E. WORDEN, M.D. and JAMES A. PATTERSON.

**Lower Extremity—Venous Circulation Studies of the Lower Extremity Using a Radioactive Tracer.** HARRY T. ZANKEL, M.D., RICHARD CLARK, B.S., and REGINALD SHIPLEY, M.D.

### TECHNICAL EXHIBITS

#### AMERICAN HOSPITAL SUPPLY CORP.—Booth 32

We will show the Multicontroller, an electronic device which allows a patient to serve many of his daily needs if he has movement in any part of his limbs or is able to move his head. We will also show special purpose wheel chairs for cerebral palsy victims and other types of patients. A third item of interest will be the new Bennett Ventilation meter for all respiratory measurement.

#### AMERICAN CYSTOSCOPE MAKERS, INC.—Booth 9

American Cystoscope Makers, Inc., extends a cordial invitation to the members and guests of the American Congress of Physical Medicine and Rehabilitation to visit their exhibit. Representatives will be in attendance to demonstrate the equipment on display.

#### BATROW LABORATORIES, INC.—Booth 18

We cordially invite you to visit and examine our exhibit which will contain our latest therapeutic and research equipment. We welcome the opportunity to be of service to you and members of your staff; and shall be looking forward to the pleasure of visiting with our friends and patrons.

#### THE BIRTCHER CORP.—Booths 1, 2 and 3

Representatives will be available to answer all questions relative to Birtcher's complete line of accepted and widely used electro-therapeutic apparatus. We wish to call particular attention to our "Megason" Portable Ultrasonic Unit as well as the "Myosynechro" Muscle Stimulator and "Cru-sader" Shortwave Diathermy.

#### THE BURDICK CORP.—Booth 42

The Burdick Corporation will exhibit their line of electro-medical equipment. Features of especial interest will be the latest additions to the Burdick line, the MW-1 Microtherm and the UT-1 Ultrasonic unit.

#### B. H. CAMP AND CO.—Booth 23

There are some new interesting developments in the Camp line at booth 23. A few minutes spent there will permit one of the representatives to bring you up to date on the latest developments and model design of those Supports and Appliances adaptable in your practice. Your patients will appreciate the comfort, quality and low cost to them when you prescribe Camp. Be sure to stop and acquaint yourself with the new method of leg traction as an example of an aid to you as well as your patient when such treatment is indicated.



**CHATTANOOGA PHARMACAL CO., INC.—Booth 5**

Effective Moist Heat easily applied: Visit our booth to see the demonstration of the Hydrocollator. Actually try one of these Packs on yourself to feel the soothing, intensive moist heat—A tremendous aid in conjunction with cervical traction, reducing troublesome pain and spasm. Ideal for your stubborn arthritic cases.

**THE COCA-COLA CO.—Booths 12 and 13**

Ice-cold Coca-Cola will be served through the courtesy and cooperation of the Detroit Coca-Cola Bottling Company and The Coca-Cola Company.

**DALLONS LABORATORIES, INC.—Booths 40 and 41**

The Dallons Laboratories, Inc., will display their latest models of the Medi-Sonar ultrasonic generators. A complete crystallographic display will illustrate the piezo-electric effect. Latest reprints and charts will be available. The Meditherm and Mediquartz lines of diathermy and ultraviolet generators will also be shown. We will welcome your visit to our booths.

**DOME CHEMICALS INC.—Booth 33**

DOME CHEMICALS INC. is pleased to invite members to our booth to discuss several useful and effective prescription specialties: DOMEROL, the original Burrow's Solution wet dressing for all acute cutaneous inflammations; ACID MANTLE CREME, indicated in the treatment of dermatosis due to a rise in the pH of the skin; VI-DOM-A CREME, containing synthetic Vitamin A in a non-greasy creme. Indicated in the treatment of slowly healing wounds, dry skin and fissures of the skin.

**ELECTRO-THERAPEUTIC INSTRUMENT CO.—Booth 37**

MYOFASCIATRON: The electronic automatically controlled low voltage muscle stimulator. Used in adjunct therapy for rehabilitation of atonic muscles in post-fractures, sprains, strains, dislocations and other trauma of the muscle and skeletal system. Automatic control enables the busy doctor to give patients the benefits of muscle rehabilitation and stimulating therapy.

**ELGIN EXERCISE APPLIANCE CO.—Booth 14**

The Elgin Exercise Appliance Company cordially invites your inspection of the Elgin Exercise Unit and the Doorway Exercise Unit. The Exercise Unit offers a facility in which both resistance and range of motion can be accurately measured and controlled. The Doorway Ensemble is designed to fulfill a need for a practical portable device.

**EVEREST & JENNINGS, INC.—Booth 20**

See the new elevating seat and the special demonstration chair loaded with accessories and modifications.

**R. A. FISCHER & CO.—Booth 19****GENERAL ELECTRIC CO., X-RAY DEPT.—Booth 44**

Whatever your needs, you can put your confidence in General Electric, manufacturers of complete x-ray equipment—from portable diagnostic to 2,000,000-volt therapy apparatus—electrocardiographs, diathermy, x-ray accessories and supplies. Service is available to you through more than 60 offices throughout the United States and Canada.

**HANOVIA CHEMICAL & MFG. CO.—Booth 30**

Hanovia will exhibit in booth 30 a complete line of ultraviolet quartz lamps for general body and orificial applications, black light lamps for diagnostic purposes and new infrared models. There will be a surprise new lamp model announcement at this meeting.

**HERBST SHOE MFG. CO.—Booth 16**

CHILD LIFE, America's finest children's shoes, are made in two types of construction. The CHILD LIFE Arch Features are built with Thomas Heels, with an innerheel wedge, long inside leather counters, steel shanks, and cordovan leather soles. The CHILD LIFE Regular are built with broad rubber heels, leather counters and cordovan leather soles.

**HILL LABORATORIES CO.—Booth 31**

ANATOMOTOR traction table, combining rolling traction with complete stretching traction; Mobile Hill Applicator—an effective and efficient apparatus for the application of dry or humid air under rigid temperature controls, for application to patient on any hospital bed will be on display.

**TED HOYER AND CO.—Booth 21**

The Hoyer Lifter safely and simply transfers patients to bed, chair or car. It can be narrowed to 24 inches or widened to 34 inches while the patient is in it. Harry Schupp of Dowd Chair Rental and Sales, Detroit, will demonstrate the usefulness and versatility of the Hoyer Lifter.

**ILLE ELECTRIC CORP.—Booth 4**

HYDROMASSAGE SUBAQUA THERAPY EQUIPMENT: Ille Electric Corporation will demonstrate in booth 4 how the care of infantile paralysis, arthritis, and other disabling conditions can be greatly improved by the use of Hydromassage Subaqua Therapy Tanks. They will display a Mobile Whirlpool Bath with Mobile Adjustable High Chair and Paraffin Bath.

**JACUZZI BROS., INC.—Booth 34**

Jacuzzi Bros., Inc., invites you to a demonstration of the JACUZZI WHIRLPOOL BATH, a truly light, compact hydrotherapy unit which in spite of its size, matches the output of the highest-priced similarly-rated equipment now on the market and can be used in any type therapy tank or tub.

**KAY INSTRUMENT CO.—Booth 36**

The Kay Instrument Company's 1035 Electromyographs, Models 103 and 104—a table and a console model, have a variety of new engineering features designed to simplify operation and provide precise performance. The new cabinet design is outstanding. You are cordially invited to see a demonstration of this apparatus.

**LA BERNE MFG. CO., INC.—Booths 27 and 28**

LaBerne will exhibit their standing (walk-off) physical therapy table. This table is designed for the treatment of polio, paranelegic and other types of physical therapy patients. Incorporated in its design is adjustable footboard, adjustable restrainer straps, adjustable cervical bar for body traction, adjustable arm sling attachment for arm and hand exercise, adjustable crutches for balance and instructing the patient in their use. The LaBerne Table is electrically operated.

**J. C. LARSON, INC.—Booth 17****THE LIEBEL-FLARSHEIM CO.—Booth 43**

The Liebel-Flarsheim Company cordially invites you to visit booth 43 in which their latest electromedical apparatus will be available for examination and demonstration. Capable representatives will be on hand at all times and we sincerely hope you will stop by so that we may become acquainted.

**R. J. LINDQUIST CO.—Booth 7**

R. J. Lindquist Company will demonstrate in booth 7, how CHRONOSONIC ULTRASOUND, the first American-made ultrasound, leads again with multiple-crystal soundheads. Treatment effectiveness is greatly increased with shorter treatment time. Also on display will be the improved CHRONAXIMETER, for evaluation of muscle function; the CHRONOWAVE stimulator, for denervated muscles; and a new light-weight portable diathermy.

**MEDCO PRODUCTS CO.—Booth 22**

The MEDCOLATOR Stimulator, for the stimulation of innervated muscle or muscle groups ancillary to treatment by massage, is a low volt generator that will generate plenty of your interest. Electrical muscle stimulation is a valuable form of rehabilitation therapy. Be sure to visit our booth for a personal demonstration.

**MEDCRAFT ELECTRONIC CORP.—Booth 11**

Medcraft will exhibit its new electromyograph, embodying developments bringing this instrument for the first time to a level usable in clinical work. Also on display will be a new ultrasonic therapy unit of unique design. Technical representatives will be on hand to demonstrate.

**THE MEDITRON CO.—Booth 39**

You are cordially invited to visit our showing of the Meditron Electromyographs, one and two channel models. An unusual accessory is the new Meditron "Stimulus Control Unit" with which Nerve Conduction Time Studies with photographic records, can readily be made on any Meditron Electromyograph. The Meditron Constant Current Chronaxiometer and the Golseth-Fizzell Constant Current Impulse Stimulator will also be demonstrated.

**MURKA MFG.—Booth 15****PAUST MFG. CO.—Booth 29**

Many thousands of physicians, physical therapists, hospitals, clinics, using ELECTRICAL MUSCLE STIMULATORS made in the Paust plant attest to ease of operation, economy in use and efficacy in therapy. Patient satisfaction in pain relief . . . muscle re-education . . . adjunct therapy in strains, dislocations, muscular atrophy, sprains, etc., are reported. Visit PAUST ELECTRONIC STIMULATOR demonstration in booth 29. See the latest, most versatile and efficient VISUAL POWER AND CURRENT STRENGTH CONTROL.

**PORTO-LIFT MFG. CO.—Booth 38**

The original producer of invalid lifting equipment, PORTO-LIFT MANUFACTURING COMPANY pioneered the development of bed patient transfer facilities. The sturdily constructed PORTO-LIFT is completely mobile, utilizing easy-to-operate hydraulic action that eliminates physical strain on attendant . . . ensures smooth and comfortable patient transfer from bed to wheel chair, conventional chair, automobile and bath.

**J. A. PRESTON CORP.—Booth 26**

J. A. PRESTON CORPORATION is showing selected items from their complete line of 1200 articles. On exhibit will be the latest REHABILITATION EXERCISE EQUIPMENT, Diagnostic Apparatus, special equipment for CEREBRAL PALSY; SELFHELP DEVICES for Activities of Daily Living; LOW VOLT GENERATORS. Be sure to register for your free copy of our new Catalog #1656.

**THE RIES CORP.—Booth 6**

"Molstaire" Heat therapy equipment delivers safe, comfortable, and effective moist heat at the DESIRED treatment temperature. This physiologically sound procedure increases the volume of local blood flow measurably and can be applied either locally or generally. It has been used consistently since 1937 and leading physicians throughout the nation have prescribed it for such cases as acute and chronic low back strains, arthritis, post-fracture care, bursitis, polio and other industrial and orthopedic problems.

**THERMO-ELECTRIC CO.—Booth 25**

On exhibit will be the Dickson Paraffin Baths, which were pioneered and developed in cooperation with Cleveland Hospitals, where they have been in continuous use for the past 15 years. Noteworthy features are mahogany mouldings designed for the comfort of the patient; double control of the melting element insuring maximum safety, and patented drain. Three models will be shown.

**JAY L. WARREN, INC.—Booth 10**

JAY L. WARREN, INC., is the sole distributor of Bailey Therapeutic Furniture. The new Bailey-Warren organization will display representative therapeutic furniture and equipment of their complete line for occupational and physical therapy, speech departments, kindergarten playgrounds, adult rehabilitation and home care. Typical are relaxation chairs, trays, individual and multiple cut-out tables, therapy stools, treatment tables and various ambulatory aids such as parallel bars, stride guides, training stairs, curb blocks, standing stabilizers, shoulder wheels and arm support cranes. Available at the booth are the new attractively illustrated catalogs fully describing the expanded Warren line of therapeutic furniture designed by Bailey.

**WEBSTER THERAPEUTIC EQUIPMENT CO.—Booth 35**

You are cordially invited to a demonstration in booth 35 of the new motorized, passive, resistive exerciser. Also on display will be the FOLDAWAY "JIM"—a compact, collapsible, portable gymnasium and the REXERCISER, a combination exercise boot, barbell and wrist exerciser in a compact, handy carrying case.

**THE WHITEHALL ELECTRO MEDICAL CO., INC.—Booth 24**

Visit the Whitehall booth for a personal demonstration of the Whitehall "One Motor" Mobile Whirlpool Bath in which the turbine assembly functions as both agitator and emptying device—agitation and emptying combined into a single motor driven system. Get the complete story on the Whitehall line of advanced hydrotherapy equipment.

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### NEW IMPROVED CURRENTS FOR BOTH...

- comfortable stimulation of muscles with normal nerve supply.
- effective stimulation of muscles with denervation present.

**model SP-5 low-volt generator**

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- ▶ Milliammeters and voltmeter aid in diagnosis; also provide operator with continuous index to treatment.
- ▶ Wide range of automatic surges and rest period between surges . . . continuously adjustable.
- ▶ Conservative design, durable construction provide maximum safety, long trouble-free service.

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Teca Corporation manufactures a full line of low volt generators from small portable units to large console models.

Send for pamphlet "Notes on Low Volt Therapy."

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TYPE-APPROVED  
MODELS TO CHOOSE FROM

CONSOLE MODEL 1000

F. C. C. NO. **U-107**

PORTABLE MODEL 1100

F. C. C. NO. **U-111**



\*Read: Archives of Physical  
Medicine & Rehabilitation  
May, 1955, pages 282-287

ADVANTAGES	Model 1000	Model 1100
Crystal size	12.5 sq. cm.	10 sq. cm.
Guaranteed total output	34 watts	20 watts
<p>Specially designed safety transducer            *Large area crystal provides uniform distribution            of energy at low temperatures            *Large area crystal provides full cylindrical            output pattern—no hot spots            Resonance control for positive tuning            Fully rectified and filtered power supply            Built-in power line filter            Completely guaranteed            Made under U.S. patents, U/L inspected and approved            Both models F.C.C. type-approved</p>		

**DALLONS LABORATORIES**

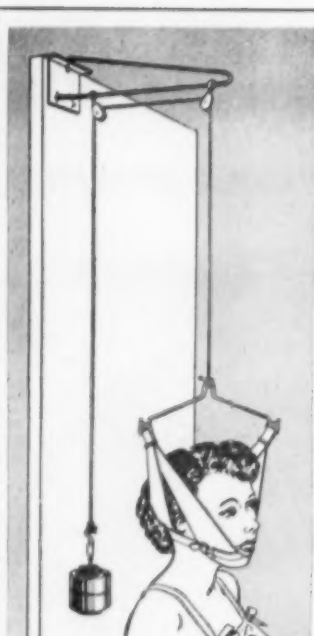
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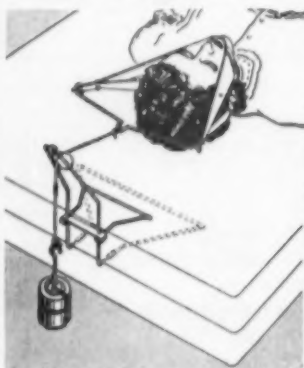


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## SELECTED OPPORTUNITIES

**WANTED—PHYSICAL THERAPISTS:** (a) Chief; 350 bd gen hosp; excel facil; Calif. (b) 2 Staff; physiatrist in chge, new air cond dept; lge teach'g hosp; desir city; So. (c) Chief; prof aurs background; 30-50 treatments pr da; 300 bd gen hosp; \$430; lovely city 100,000; MidE. (d) Reg'd; 17 man clin grp; twa 50,000; S-central. (e) Chief; 300 bd gen hosp; res suburb univ city; SE. (f) Child orth unit, 200 bd gen hosp; lovely twa 30,000; Ohio. (g) Reg'd; excel dept facil; 150 bd gen hosp; \$350 & mls; univ med ctr; E. (h) Chief; 600 bd univ affil hosp; Pac NW. (i) 3 reg'd; expnd'g dept; lge gen hosp; Calif. (j) Chief; 300 bd gen hosp; attrac res twa 50,000; SE. (k) Modern dept; 270 bd teach'g hosp; city 100,000; W. (l) Staff; 600 treatments pr mo; 200 bd gen hosp; \$4000 up; univ city; MW. (m) Chief; 125 bd gen hosp, expnd'g to 250; lovely twa 80,000; SW. (n) Vol gen hosp 150 bds; 5 orth surg on staff; attrac twa 30,000; NW.

Please send for an analysis form so we may make an individual survey for you. We offer you our best endeavors — our integrity our 59 year record of effective placement achievement. Strictly confidential. Woodward Medical Bureau, 185 N. Wabash, Chicago.

## OPPORTUNITIES AVAILABLE

**WANTED—Physiatrist,** direct department, new hospital, affiliated medical school; East. For further information, please write Burnice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

**WANTED:** (a) Senior physical therapist; voluntary general hospital, 600 beds; teaching affiliation; large city, medical center; Pacific Northwest. (b) Chief; new physical therapy department, 400-bed hospital; college town, East. (c) Physical therapist experienced in handling cerebral palsied children; new treatment center affiliated with crippled children's hospital; university town, Southwest. (d) To take charge new department, small general hospital; Michigan. (e) Two physical therapists interested in living in California; voluntary general hospital, 400 beds; department directed by physiatrist; expansion program. (f) Association with two American board surgeons; Midsouth. (g) Chief therapist; preferably man interested in both administrative and practice; duties include teaching; new 400-bed hospital; university medical center, South; outstanding opportunity. (h) Therapist, man or woman to take charge of departments, two crippled children's clinics; 4 days each month would be expected to travel to do followup work in surrounding counties; West. (i) Chief occupational therapist qualified to organize and direct the department; medical center, Midsouth. (j) Staff occupational therapist; 400-bed hospital; hour's drive from New York City.

For further information regarding these opportunities, please write Burnice Larson, Medical Bureau, Palmolive Building, Chicago.

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This course is open to graduates of approved schools of physical and occupational therapy. Such graduates must be members of the American Physical Therapy Association and/or American Registry of Physical Therapists, or American Occupational Therapy Association.

Entrance Dates: First Monday in January, April and October.

Course I — Emphasis on care of convalescent neuromuscular disease with intensive training in functional anatomy, muscle testing, muscle reeducation and use of supportive and assistive apparatus. This course is complete in itself.

Course II — Three months duration with course I prerequisite. Emphasis on care of severe chronic physical handicaps with intensive training in resumption of functional activity and use of adaptive apparatus.

In-Service Training Program — Fifteen months duration at salary of \$225 per month plus full maintenance. This program includes training in courses I and II.

Tuition: None. Maintenance is \$100 per month. For scholarship to cover transportation and maintenance for courses I and II, contact National Foundation for Infantile Paralysis, Inc., 120 Broadway, New York 6, New York. (Scholarships require two years of experience).

For further information contact:

**ROBERT L. BENNETT, M.D.**

Medical Director  
Georgia Warm Springs Foundation  
WARM SPRINGS, GEORGIA

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**100** YEARS AGO, during a frontier skirmish, an Indian brave, singing his own death song, charged down on a young officer. Lieutenant George Crook, 4th Infantry, coolly fell to one knee, carefully aimed, and dropped the brave in his tracks.

It was not Crook's first Indian, nor his last. By the time he made general, Crook was the greatest Indian-fighter this country has ever had.

Yet, he was also one of the best friends the Indians have ever had. For he understood them well, dealt fairly and firmly, and always kept his promises.

When Crook died, Indians wept. And a Sioux chief named Red Cloud said: "He never lied to us. His words gave the people hope."

No nation can ever have enough men like George Crook. But America had, and still has, a lot of them. That's important to remember. Because it is a wealth of human character rather than a wealth of money that gives America its real worth. Just as it is the Americans, all 160 million of them, standing behind our country's Savings Bonds, who make these Bonds one of the world's finest investments.

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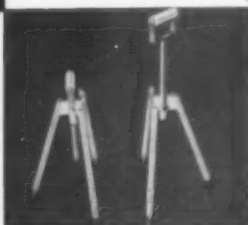
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*Bailey's Therapeutic Furniture establishes the correct posture—for "as the twig is bent, so the tree will grow."*

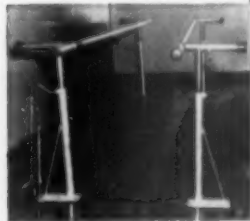
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in conjunction with the

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HOTEL STATLER

— Aug. 28-Sept. 2, 1955 —

DETROIT

### PERIPHERAL VASCULAR AND PERIPHERAL NERVE DISEASE

*Monday, August 29*

- 9:00 - 9:50 A.M. PATHOLOGY OF PERIPHERAL BLOOD VESSELS. A. James French, M.D., Ann Arbor, Mich.  
10:00 - 10:50 A.M. TREATMENT OF PERIPHERAL VASCULAR DISEASE. Karl Harpuder, M.D., Bronx, N.Y.  
11:00 - 11:50 A.M. NEUROANATOMY OF THE EXTREMITIES. George C. Rinker, M.D., Ann Arbor, Mich.  
2:00 - 2:50 P.M. VALUE AND LIMITATIONS OF ELECTRICAL STIMULATION IN PERIPHERAL NERVE LESIONS. Jerome Gersten, M.D., Denver.  
3:00 - 3:50 P.M. MUSCLE ACTION POTENTIALS: THEIR CAUSE AND MEASUREMENT. Edward H. Lambert, M.D., Rochester, Minn.  
4:00 - 4:50 P.M. ELECTRODIAGNOSTIC METHODS IN PERIPHERAL NERVE LESIONS. H. D. Bouman, M.D., Madison, Wis.

*Tuesday, August 30*

- 8:00 - 8:50 A.M. PHYSICS AND PHYSIOLOGICAL EFFECTS OF ULTRASOUND WITH EMPHASIS ON ITS EFFECT ON PERIPHERAL MUSCLES AND NERVES. Justus F. Lehmann, M.D., Columbus, Ohio.  
9:00 - 9:50 A.M. NERVE REPAIR AFTER INJURY. E. S. Gurdjian, M.D., Detroit.

### PSYCHIATRIC AND VOCATIONAL TOPICS OF REHABILITATION

*Monday, August 29*

- 9:00 - 9:50 A.M. PERSONALITY STRUCTURE AND ITS EFFECT ON REACTION TO CRIPPLING ILLNESS. John C. Nemiah, M.D., Boston.  
10:00 - 10:50 A.M. HELPFUL AND HARMFUL ATTITUDES OF THERAPISTS AND PHYSICIANS TOWARD PATIENTS. Jack Meislin, M.D., Montrose, N.Y.  
11:00 - 11:50 A.M. PSYCHIATRIC ASPECTS OF CHRONIC BRAIN DISORDERS AND THEIR IMPORTANCE IN PHYSICAL MEDICINE AND REHABILITATION. M. M. Frohlich, M.D., Ann Arbor, Mich.  
2:00 - 2:50 P.M. PSYCHOTHERAPEUTIC EFFECTS OF EXERCISE AND WORK THERAPY. Ivan C. Berlien, M.D., Detroit.  
3:00 - 3:50 P.M. VOCATIONAL APTITUDE TESTING. Kenneth W. Hamilton, Ph.D., Columbus, Ohio.  
4:00 - 4:50 P.M. PRINCIPLES OF VOCATIONAL TRAINING FOR THE HANDICAPPED. Kenneth W. Hamilton, Ph.D., Columbus, Ohio.

*Tuesday, August 30*

- 8:00 - 8:50 A.M. THE SHELTERED WORKSHOP AS A STAGE IN REHABILITATION. Emil Trapani, New York City.  
9:00 - 9:50 A.M. INDUSTRIAL PLACEMENT OF THE PHYSICALLY HANDICAPPED. E. A. Irvin, M.D., Dearborn, Mich.

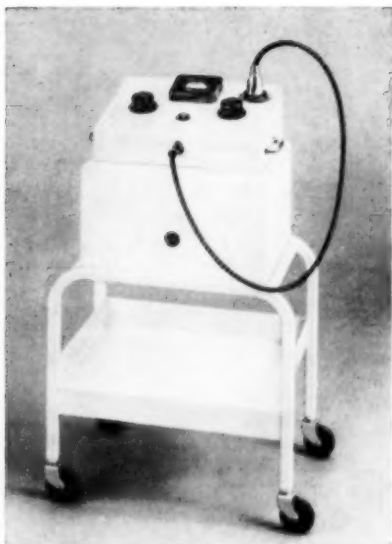
Physicians as well as physical therapists who are registered with the American Registry of Physical Therapists will be permitted to register for these courses. Members in good standing of the American Occupational Therapy Association are also eligible to enroll in the seminar. The schedule of the seminar as arranged, will permit attendance at both the course and scientific sessions.

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